

The Health of Washington State Addendum

A statewide assessment of health status,
health risks, and health systems

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Introduction

Purpose

The Health of Washington State (HWS), initially published in 1996, was conceived as an objective statewide appraisal of health in Washington State from three important perspectives: the health *status* of the people in the state, the major health *risks* they face, and the health *systems* that exist to protect, maintain, and improve their health.

This document supplements the information contained in that first publication. In the ensuing two years, changes have occurred—some quite dramatic—in the physical environment in which we live, in the systems by which we deliver and receive health care, and in the medical and social issues that affect our health and our lives.

To reflect and better understand these changes, this addendum includes updates of some of the sections in the 1996 *HWS* for which new, significantly different information on prevalence and distribution, causal/risk factors, or successful interventions is now available, as well as new sections that focus on issues for which such information has only recently become available. Furthermore, to gain insights into the public health issues we will be facing in the not-too-distant future, we have also summarized preliminary, still incomplete, information on selected emerging issues.

This addendum is intended to be used side-by-side with the 1996 *HWS* as a source of empirical information for statewide policy decision-making, prioritization of efforts, program management, budget development, and resource allocation. We hope these combined documents will provide a “big picture” appraisal of what we know and what we can do about the public health problems in Washington, and will demonstrate an approach for using data and information for decision-making.

However, this addendum to *The Health of Washington State* is only one manifestation of an ongoing health assessment process at the local, state, and national levels. To be

successful, this process must include not just the gathering and presentation of objective data and information, but also informed discussion at all levels of what we know, what we can do, and what we are willing to do to effect positive changes.

Content

Health Indicators. To provide continuity with the public health improvement process begun in 1993, the first edition of *The Health of Washington State* focused on about 50 health indicators that were adapted from the “performance measures” listed in the November 29, 1994 *Public Health Improvement Plan*. These indicators covered a range of “sentinel” events in six different areas: infectious diseases, non-infectious diseases, violence and injury, family and individual health, environmental health, and health systems.

In this addendum, we have updated the information to reflect significant changes in our knowledge of the distribution, cause, and/or prevention of hip fractures (for which the prevention of osteoporosis has become the principal focus), medically underserved areas, and access to essential services (especially in light of the movement toward more outpatient-based services). In addition, due to the recent availability of life-prolonging treatments for HIV infection, we have revised the summary of HIV/AIDS to reflect the dramatic changes in the descriptive epidemiology of AIDS, as well as the available prevention strategies.

As in the 1996 *HWS*, the new indicators discussed in this addendum once again are generally representative of more comprehensive public health focal areas, which range from children’s health care issues (focusing on pediatric oral health and children with special needs), to domestic violence, to the burden of injury and death due to drownings and recreational water-related injuries, to the emergence of antibiotic-resistant infectious disease threats.

Standardized Format. To facilitate comparability with the 1996 *HWS*, most of the sections of this addendum are once again presented in a standardized format that includes a definition of the subject covered, a summary, and presentation of the most recent data obtained from existing local, state, and national sources showing where we are and how we got there. Each section also provides available information about known risk and protective factors and high-risk groups, and concludes with a discussion of interventions that have proven to be effective in mitigating or preventing the identified problem.

Future Focus. Finally, in an attempt to reflect the dynamic nature of the challenges that we constantly face on many fronts in the practice of public health, we have provided preliminary, yet provocative, information on several issues that are emerging in our awareness. These issues include:

- the aging of our population and the concomitant increase in the prevalence of chronic diseases, demand for health care services, and diminution of quality of life;
- the emergence and reemergence of infectious diseases;
- growing recognition of environmental factors and how they affect health; and
- changes in the health care delivery system and their potential impact on the how we prevent, identify, and treat diseases and injuries.

Our current understanding of these, and other, emerging threats is sparse, but we have tried to provide some insights into these issues in the final section of this addendum. We hope that future efforts to acquire more complete information and effective prevention tools can be built on this preliminary information.

Use of the Information

These combined documents can be used to show what we know generally about health status, risks, and systems in Washington State. Perhaps of equal importance, they also show what we *don't* know—where there are gaps in our monitoring data or in our basic knowledge of underlying processes by which disease, injury, disability, and premature death affect us, and where we have no proven approaches for bringing about desired outcomes.

Revised Indicators

Access to Essential Health Services

Definition: "Essential health services" are primary health care, short-term general hospital care, prenatal and postpartum care for uncomplicated births, pharmacy services, and emergency medical services. Access to such services is affected by such factors as time, transportation, geography, distance, economic status, language, culture, and insurance coverage and managed care contracting practices.

Summary

Access to essential health services is adequate for much of the state. However, some areas of the state and some populations remain underserved. A recent analysis of potentially avoidable hospitalizations in Washington State suggests that inadequate access to health care resulted in over 11,000 unnecessary hospitalizations in 1996. Of particular concern are rural areas, American Indians and Alaskan Natives, refugees, migrant and seasonal workers, and children. Recent decisions on how some managed care organizations contract with rural providers have also complicated access.

Access can be improved by strengthening and supporting existing facilities and networks, by targeting services to address transportation needs, and by eliminating linguistic and cultural barriers. Access will also be influenced by the rapid introduction of telecommunications technology and evolution of telehealth and telemedicine.

Time Trends

Hospitals. For Washington State as a whole, 98% of the population lives within 30 minutes of general acute care hospitals; however, in 36 census divisions in 20 rural counties, the population lives more than 30 minutes from such services.

The number of acute care hospitals has been fairly stable since 1995. However, one district hospital closed in 1997, and, as in 1995, eight rural hospitals (six of which are in Eastern Washington) do not provide obstetric services. Obstetric care for low-income women became more accessible as Medicaid's First Steps program continued to provide increased payment to practitioners and hospitals.

Primary Care. The number and use of publicly subsidized health centers providing primary health care to low-income populations have increased

over the past two decades. Twenty-eight state and federally funded community and migrant health centers provided services at 60 delivery sites in 1997. The number of rural health clinics has doubled to 55 sites since 1995

Pharmacies. The total number of retail pharmacies statewide increased from 983 in 1994 to 1,021 in 1997; of these, 53.7% were chain-store pharmacies in 1997, compared with 41.7% in 1994. Nonetheless, rural access to pharmacy services has not improved in the last two years and remains a problem in some areas. Forty-eight rural communities have only one retail pharmacy in town.

Health Insurance. Washington State has made progress in ensuring health insurance coverage. Estimates of the state's uninsured population show a decline from 12.2% of residents in 1994 to 10.9% of residents in 1996.¹ Less is known about the adequacy of insurance coverage or access to appropriate providers for the insured group.

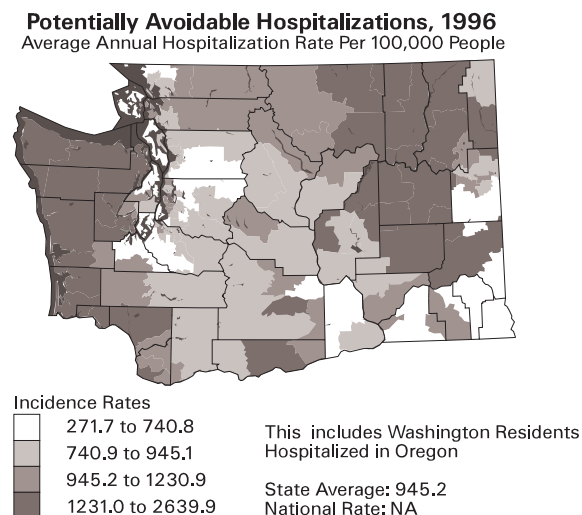
Year 2000 Goal

Access to essential health services is not directly addressed among year 2000 goals, although the managed care industry has a national access standard. This standard is that at least 90% of the population should be within 20 miles or 30 minutes travel time of general hospital services and primary care practitioners. In 1997, 98% of Washington State residents lived in areas that met this condition.

Geographic Variation

"Potentially avoidable hospitalization" (PAH) is a term used to describe hospital admissions that might have been prevented if adequate and timely ambulatory care had been available. In 1996, more than 52,000 PAHs in Washington accounted for 10% of all hospitalizations. (See technical notes.) The map below shows that the highest PAH rates

are predominantly in the rural parts of the state. (Note that the low rates in southeastern Washington may reflect the lack of hospitalization data available from Idaho.) If the hospitalization rate in areas with the lowest rates was applied statewide, then over 11,000 excess hospitalizations could have been prevented in 1996.



Age and Gender

Initial analysis of PAH data has focused on determining the overall magnitude and geographic variation in PAH rates statewide, and on calculating an estimate of the “excess” PAHs that could have been prevented if an “attainable” rate applied. Future analyses will focus on other dimensions, including variation by age and gender.

Risk and Protective Factors

Geographic Access: Rural populations face provider shortages, poor or mountainous roads, ferry systems, and long distances to essential services. In urban areas, traffic congestion and complex public transit routings can be barriers. The residents of Puget Sound islands face unique access challenges.

Transportation: In 1996, 85.8% of the state’s population lived in areas served by public transit. The proportion of residents in the state’s 28 rural counties served by transit districts increased from 53% in 1994 to 64% in 1996.² Fourteen rural counties currently have no public transit available, and even among counties with transit service, the existence of service does not necessarily imply scheduling that accommodates timing of medical appointments or reasonable access. Furthermore,

in large urban counties, many outlying rural areas lack public transportation.

Telecommunications Infrastructure: Health care delivery is increasingly dependent on telecommunications. The infrastructure in some parts of the state has not kept up to the demands for electronic exchange of data, whether for Internet access, faxing, or the more complex demands of telemedicine and telehealth applications.

Financial Stability: Health services in rural areas are highly interdependent. Financial difficulties in one part of a local system may have effects elsewhere in the system. The financial condition of rural hospitals is especially tenuous. In 1995 and 1996, 18 of 42 rural hospitals reported negative net operating revenue in one or both years.³ In addition, many other parts of the health care system, including clinics and long-term care facilities, face ongoing financial difficulties.

Health Insurance Coverage: Access to essential health services is strongly influenced by changes in insurance and managed care industry rules and procedures governing the provision of service and payment. These are changing rapidly. Managed care contracting is increasing and will likely impact local providers, especially rural providers who have a relatively weak negotiating position (because their service volumes are low) with respect to managed care providers. The full effects of the move to managed care in rural areas are still being studied.

Linguistic and Cultural Barriers: In 1990, 64,625 Washington residents (about 1.5% of the total adult population) did not speak English very well or at all, but this proportion varies greatly among local communities. For example, in Yakima County, 35% of the Hispanic population did not speak English. In King County, 20% of the Asian/Pacific Islander population had a language barrier.

Access to and utilization of health care have improved when services are available in the person’s language, are consonant with their belief system, and are offered in combination with interpretation services.

High-risk Groups

Children: According to the 1996 Washington State Family Health insurance survey, 7.7% of all children 18 years old or younger (a total of over

120,000) were uninsured.⁴ The number of children under 18 years of age enrolled in Medicaid as of July 1997 was 437,902; Medicaid is the largest purchaser of health care coverage for children in Washington. However, there are an additional 60,000–90,000 children whose families are at or below 200% of the federal poverty level are eligible for Medicaid, but are not enrolled.

American Indians and Alaskan Natives: This population comprised 2% of the total state population in 1996. Access to essential services, particularly specialty and hospital care, among American Indians and Alaskan Natives is complicated by a fragmented health care delivery system with variable eligibility criteria for primary, specialty, and hospital care.⁵ For example, many Indian Health Service facilities only provide coverage during weekdays. After-hours, weekend, and hospitalization coverage occurs in the private sector.

Migrant and Seasonal Farmworkers: The migrant and seasonal farmworker population in Washington State (including dependents) peaked at between 225,000 and 275,000 in 1996.⁶ As many as 200,000 seasonal workers and adult dependents lacked health coverage in 1993.⁷ Most rely on the system of Migrant and Community Health Centers for care. In addition, migrant and seasonal farmworkers are more likely to have lower family incomes, face language barriers, and lack transportation options—all of which inhibit access to health care services.

Intervention Points, Strategies, and Effectiveness

The establishment of clear standards of service in health insurance contracts increases the likelihood that managed care providers and insurers will provide services that are geographically available, culturally and linguistically appropriate, accessible to the disabled, and sensitive to individual needs and differing abilities to understand and cope with the health care system. As one of the largest purchasers of health insurance in the state, Washington State government has significant leverage in this area.

The formation of local networks of physicians, hospitals, community organizations, and public entities encourages combining of local resources and can result in more stable health care services in rural areas. Rural areas without effective local networks are more likely to have

fragile health care systems⁸, although not all networks are successful. Grants and technical assistance have helped sustain the development of these networks, but design and implementation issues remain.

Improved Evaluation of Access Issues: Efforts to identify health care staffing, deployment, and access issues and to target existing resources are hampered by the lack of data on ambulatory care visits in the state. Better data on ambulatory health care, collected directly from providers through the Health Plan Employer Data and Information Set (HEDIS) or through an alternative instrument, could provide critical information for evaluating access issues.

Telemedicine and Telehealth: There is dramatic growth in the use of telecommunications technology to support telemedicine and telehealth. These approaches to health care service delivery enhance the ability of health care providers to deliver specialized services from distant locations. Providers use networks for education, teleconferences, and consultations. At least three formal telemedicine networks now link rural and urban providers in Washington State, and additional new networks are being formed. It is hoped that telehealth and telemedicine will have significant impacts on access; however, to date, there has been no systematic evaluation of those impacts.

Critical Access Hospitals: The critical access hospital (CAH) model offers an alternative designation to hospitals in relatively isolated rural communities which provide limited inpatient services. This designation is intended to ensure that emergency services are preserved and arrangements for transfer and referral with other facilities are maintained. This qualifies these hospitals for Medicare reimbursement on a reasonable-cost basis rather than a prospective or fixed rate. Evaluations of this model in other states have established that the CAH model has improved the financial stability of rural hospitals with significant Medicare billings.

Prenatal and Postpartum Care for Uncomplicated Births: The First Steps program has successfully demonstrated models that improve geographic access through its alternative maternity care clinics staffed by nurse practitioners—certified nurse midwives and by providing transportation services.

Transportation: Transportation for those who do not have a private vehicle remains a major access barrier in many areas. In response, programs to provide transportation to approved health services for those who have no other means of transportation have provided for over 2,130,000 trips in 1996, an increase of 49% over 1992.⁹

Increasing Children's Health Insurance Coverage: Evaluations have shown that increases in the availability of health insurance increase children's access to all health care services. Insured children are more likely to use preventive and primary care services, and to have a relationship with a primary care physician.¹⁰

For More Information

Office of Community and Rural Health, State Department of Health, (360) 705-6764.

Technical Notes

The term "potentially avoidable hospitalization" (PAH) describes hospital admissions that might have been prevented if adequate and timely ambulatory care were available. This PAH analysis was based on a set of diagnoses and diagnostic code sets identified from a review of previously published PAH studies. The state hospitalization database (CHARS) was analyzed to extract hospitalizations of Washington State residents matching these codes as primary diagnosis at discharge. Oregon hospitalizations (of Washington residents) were added, but data on hospitalizations in Idaho were not available. Rates were calculated using Office of Financial Management 1996 population estimates.

PAH rates were plotted by Health Service Areas (HSAs). The HSAs are divided into four groups in a two-step process. First, the areas are divided into two groups based upon whether the area rate is above or below the rate for the state as a whole. Second, these two groups are subdivided, such that equal numbers are above and below the cut-point. The highest rate seen in the lowest rate group (i.e., the cut-point) was selected to serve as the reference rate. If this "attainable" rate were seen statewide, fewer hospitalizations would have been observed. This attainable rate was applied to the population of the state to calculate an expected number of hospitalizations. The expected number of hospitalizations was subtracted from the observed number of PAHs to estimate a count of "excess" hospitalizations.

Note that "potentially avoidable" is not the same as "preventable." Some, but not all, of these hospitalizations could be unnecessary. Second, PAHs may not be the ideal measure of consequences of poor access to essential health services. Improvements in access to adequate/timely ambulatory care might not reduce the number/rate of hospitalizations, but might instead reduce the severity of illness in each hospitalization. Third, other factors also influence hospitalization rates in these chosen diagnoses. For example, environmental pollution influences the occurrence of asthma and could result in greater numbers of hospitalizations in certain areas or population subgroups. Fourth, PAH rates may

vary by factors not yet analyzed (e.g., age and sex, spatial and temporal).

Endnotes:

¹ 1996 Current Population Survey (CPS), United States Census Bureau March, 1996 and the RAND / RWJ Washington State Family Health Insurance Survey, 1996.

² Public Transportation Systems in Washington State. Olympia: Washington State Department of Transportation, 1996 Summary.

³ Summary Information Regarding Washington State Rural Hospitals and the Proposed Senate and House Rural Health Improvement Act. Olympia: Office of Community and Rural Health, June 13, 1997.

⁴ Washington State Family Health Insurance Survey. Rand/MPR/RWJF 1996.

⁵ American Indian Health Care Delivery Plan. Olympia: Washington State Department of Health, July 1997.

⁶ Office of Community and Rural Health estimate derived from data in *Agricultural Workforce in Washington State 1996*. Olympia: Washington State Department of Agriculture, 1996.

⁷ Seasonal Employee Health Insurance: Analysis and Recommendations: Report to Governor Mike Lowry, Seasonal Workers' Health Benefits Work Group of the Washington Health Services Commission. Olympia: December 17, 1993.

⁸ Antitrust Issues in Rural Washington State. Seattle: University of Washington Rural Health Research Center, December 1996.

⁹ Public Transportation Systems in Washington State: 1996 Summary. Olympia: Washington State Department of Transportation, September, 1997.

¹⁰ Health Insurance: Coverage Leads to Increased Health Care Access for Children. Washington, DC: US General Accounting Office, November, 1997.

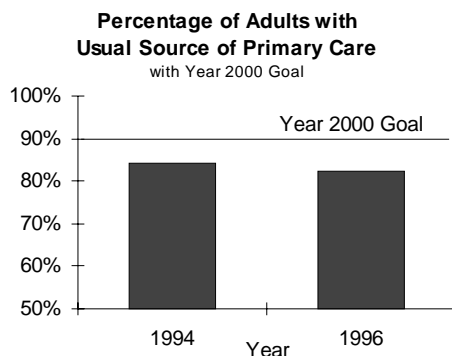
Availability of Primary Health Care Services

Summary

Primary care practitioners are usually a patient's first point of contact for health care services and play a crucial role in providing coordinated, continuous care. In 1996, 82.2% of adults in Washington reported having at least one regular source of primary health care. Although the state as a whole meets standards for primary health care availability, several areas of the state have a shortage of primary care providers.

Shortages are caused by difficulty recruiting and retaining physicians in rural areas and for underserved populations in both rural and urban areas. Barriers include lower salaries; lack of facilities and ancillary services; isolation from support networks, training, and advancement opportunities; and social and economic isolation.

Effective strategies for reducing shortages are loan repayment and other financial forgiveness for health professional school debts, linking isolated providers with broader support networks, and connecting health professional education programs with clinical practices in rural areas and in community, migrant, or American Indian health clinics. Social and economic barriers to recruitment and retention are more intractable problems.



Definition: Primary care practitioners are: medical and osteopathic doctors (MD & DO) who specialize in family/general practice, obstetrics/gynecology, general internal medicine, or pediatrics; naturopathic physicians; physician assistants; and advanced registered nurse practitioners in family/general, geriatric, or pediatric practice, and women's health care. Availability is measured by using a ratio of provider to population after adjusting for level of poverty, use of prenatal care, and proportion of aged persons in the target population. (See technical note.)

Time Trends

Since 1969 there has been an improvement in the overall supply of primary care physicians (family practice/general practitioners, pediatricians, and general internists) nationally and in Washington State. The national ratio of primary care doctors to population improved from one primary care provider per 1,551 persons in 1980 to one per 1,264 in 1995.¹ In Washington State, the ratio improved from one per 1518 in 1984 to one per 1274 in 1994.² However, while the overall supply of primary care physicians has improved, the distribution remains a problem.

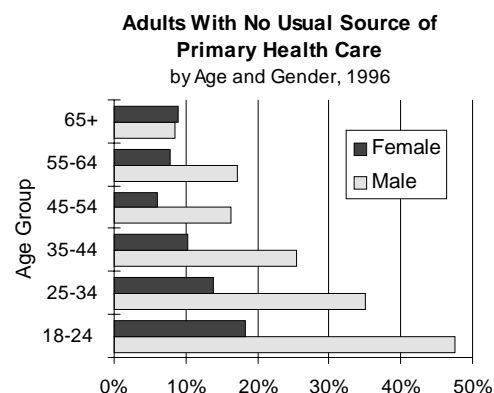
Year 2000 Goal

The national year 2000 goal for primary health services is that at least 95 percent of the population will have a specific source of ongoing primary care. In 1991, the national baseline for adults was 80%.

Washington's year 2000 goal is that at least 90% of adults will have at least one usual source of primary care. In 1996, 82.2% of the adult population had at least one regular source of primary care, a slight decline from 1994.

Age and Gender

According to results of the 1996 Washington State Behavioral Risk Factor Survey (BRFSS),



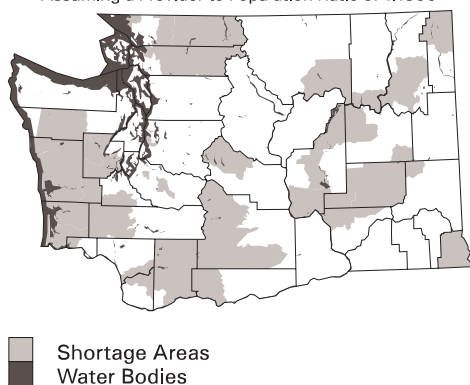
younger adults, especially males in the 18–34 age group, were the least likely to have a usual source of care. The proportion of adult men under age 55 without a usual source of care was significantly higher than that for adult women; for all adults, 24.2% of the men and 8.9% of the women reported no usual source of primary health care.

The Poor: When asked why they had no usual source of primary health care, 55% of respondents to the 1996 BRFSS survey said they did not need a doctor, and 22% said they could not afford one. This former statistic may imply that primary care is perceived more as a source of treatment rather than as a source of prevention services. Another 11% of the adult population indicated that they had needed, but had not seen a doctor during the previous 12 months because of cost. This proportion remained unchanged from 1994.

Primary Health Care Shortage Areas

The map below shows the distribution of Health Service Areas (HSAs) classified as having fewer than one primary care provider for every 1,500 persons living there in 1996. An HSA comprises a group of zip codes clustered around a hospital, medical center, clinic, or hospital district. Twenty-four HSAs were designated as shortage areas in 1996; eliminating all of these shortage area designations would have required placement of a total of 113 primary care practitioners. (See technical note).

State Designated Shortage Areas for Primary Care, 1996
Assuming a Provider to Population Ratio of 1:1500



High-risk Groups

Rural Areas: Two-thirds (16) of the designated shortage areas were located in rural areas. Rural areas are especially vulnerable because they rely on generalist providers for a larger share of

health care. Provider recruitment and retention in rural areas remain difficult. The recruitment and retention problems are exacerbated because many existing providers are near retirement, thereby raising concerns among prospective hires about adequate on-call and emergency room coverage in the future.

Underserved Populations: Migrant and seasonal farmworkers and low-income households have difficulty paying for care. Although many are eligible for Medicaid and other “safety-net” insurance programs, eligibility requirements may limit access, especially to unmarried younger men. Even when subsidized insurance is available, some doctors in private practice and in managed care organizations are reluctant to accept a large number of patients on sliding fee discount schedules or Medicaid. Consequently, the underserved often rely on subsidized clinics for care. These facilities also face significant recruitment and retention challenges and have limited resources to deliver uncompensated care.

Other Measures of Impact and Burden

The lack of a sufficient number of primary care providers can affect the entire health care delivery system in a community. In some areas of the state, the loss of a single rural practitioner might mean that other primary care practitioners must treat more patients and work longer hours. Other practitioners (for example, chiropractors, mental health practitioners, ophthalmologists, optometrists, podiatrists, or emergency medical personnel) face heavier burden as they become surrogate primary care providers. Or, worst of all, patients do not seek or defer preventive or maintenance care for chronic health problems until their condition becomes emergent.

Prenatal and Postpartum Care for uncomplicated births is usually provided by primary care providers. However, the proportion of family practice physicians delivering babies in Washington decreased from 61% in 1985 to 46% in 1989, possibly as a result of a 1985 increase in malpractice insurance premiums for obstetrics.³

Risk and Protective Factors

Barriers to recruiting and retaining primary care providers for underserved areas and populations are complex.

Mix and Supply of Primary Care Providers.

The total supply of primary care providers is increasing in the state, and more physician and mid-level graduates are choosing primary care specialties. Significant provider shortages remain in some rural areas of the state and for underserved populations. Women and minorities make up an increasing share of the graduate medical population in Washington (over 50 %). However, women and minorities are significantly less likely to practice in rural areas or to provide care for underserved populations.⁴

Poor Linkages Between Health Professional Training Programs and Underserved Areas and Populations. Knowledge of and experience in providing clinical care in underserved areas are linked to increased recruitment and better retention in these settings. However, there are substantial barriers to establishing these linkages—facilities in these areas are often not located near medical schools, they have inadequate volume of patients, or the mix of medical staff needed to meet training program requirements is not available.

Competitive Salaries and Working Conditions. Publicly funded health care delivery systems in rural areas, which are more likely to be financially fragile, are less likely to be able to offer salaries competitive with urban facilities. Physicians serving in rural areas also cite long hours, lack of back-up, isolation from colleagues, and difficulty leaving for training or vacation as problems in these practice settings.⁵

Social and Economic Issues are the most intractable barriers to recruitment and retention. These can include cultural and linguistic barriers or the difficulty fitting into close-knit rural communities and small practices. Isolation from cultural and education opportunities and lack of employment options for spouses also complicate recruitment and retention efforts.

Intervention Points, Strategies, and Effectiveness

Community Assessment Activities. Community assessment of the need for practitioners is the first step in addressing shortages. Collaboration among communities and public and private agencies provides an accurate assessment of community needs and resources. Coupled with profiles of existing health professionals in practice, this information provides a better understanding of

community needs, and increases the likelihood of successful recruitment and retention efforts.

Higher Education Institutional Planning (HEIP) coordinates the development and implementation of state goals to address health personnel shortages among state agencies and higher education institutions. HEIP monitors progress and holds educational institutions accountable for contributing to state goals.⁶ Washington State's HEIP process has helped focus attention on the need to increase the number of American Indians and persons of color in the health professions, to increase the number of graduates placed in underserved areas, and to provide specialized training for practitioners to enable them to better meet the needs of target populations.

Clinic Infrastructure for Serving Vulnerable Populations. State and federal funds have helped to develop a network of 60 community/migrant health clinics and 55 rural health clinics that make services available to underserved populations in Washington. Washington State's Indian Health System includes 28 tribally operated health clinics.

Increasing the Supply of Mid-level Primary Care Providers. The University of Washington School of Medicine has increased the numbers and distribution of physician assistants in underserved areas. Over the past four years, MEDEX Northwest, the University's physician assistant training program, has increased the number of students trained by 50%.

Loan Repayment and Scholarship Programs that require a service obligation in exchange for health professions school tuition and other financial assistance provide incentives for primary care practitioners to work in Washington's underserved areas. Prominent among these programs, the National Health Service Corps located 69 providers in underserved areas in Washington in 1997. Since 1990, the Washington State Loan Repayment program has also directed 72 practitioners to targeted areas of need. Since 1993, all but a few of the practitioners who completed their contracts under this program have stayed in these shortage areas. In addition, 138 scholarship recipients are currently working in underserved areas throughout Washington.

International Medical Graduates are available to enter into three-year employment contracts in areas of critical shortage for which U.S.-trained providers cannot be recruited. Washington State

can sponsor up to 20 visa waivers for foreign trained providers. This program has increased the number of opportunities for foreign medical graduates in Washington from nine in 1995 to 20 in 1997. Long-term retention and community compatibility issues associated with this program have not yet been evaluated.

Cross-credentialing in some professions can decrease the need for larger numbers of practitioners in an area by increasing flexibility. For example, one community college in the state has successfully integrated programs in nursing, laboratory assistant, and respiratory therapy assistant to train health care personnel to provide more comprehensive care to clients in rural hospitals and home care settings.

Locum tenens programs place qualified substitute providers in rural clinics, hospitals, and other practice settings needing temporary assistance to maintain availability of services when a provider leaves for short periods.

Support Networks. Health care systems in communities without local networks (physician, physician-hospital, or hospital-hospital) are more likely to be financially vulnerable or otherwise less stable. Early indications are that communities with effective networks are more likely to be able to recruit and retain physicians.⁷

Providing Training Opportunities in rural and underserved settings increases the likelihood that health care school graduates will understand the skill sets needed and working conditions for rural and underserved placements. As an example, the Rural/Urban Underserved Opportunities Program at the University of Washington places students between their first and second years of medical school with a preceptor in a rural or urban underserved clinical site. The Washington State Fellowship Program also encourages diverse health profession students to experience a rotation in a rural community/migrant health center, professional shortage area, or a rural practice. Through programs like these, Washington's two Area Health Education Centers have placed over 2000 students in rural and underserved sites in the past 12 years. Similarly, the Northwest Portland Area Indian Health Board manages the Graduate Health Programs Recruitment Project and the Northwest Tribal Recruitment Project to recruit providers for Indian health programs and to encourage American Indians into health careers.

Data Sources

1994–95 Health Personnel Resources Plan

1996 Washington State Health Workforce Analysis

Health Personnel Factbook of United States (USDHHS 1993).

Health Professions Licensing Data Base, Health Professions Quality Assurance Division, Washington State Department of Health

Washington State Birth Records, Health Information Division, Washington State Department of Health

For More Information

For information contact the Office of Community and Rural Health (360) 705-6770.

Technical Notes

The State Department of Health Workforce Analysis bases practitioner counts for generalists on a voluntary survey of those listed in the state's professional licensing system. As the survey is voluntary it is necessary to estimate the number of respondents. Since it is a personal choice to keep an active license, counts may include licensed practitioners who are retired, work part time, or do not work. The practitioner count is adjusted to include only those with an active license living within state boundaries who are 63 years of age or under. The population of each area was adjusted for gender and age to account for differences in use of health services.

A simple ratio of practitioners to population does not adequately reflect areas with primary care practitioner shortages. Demand is related to the proportion of the population in three high-risk groups: those in poverty, the elderly, and women in need of prenatal care. To take these factors into account standard scores for these variables were added to the ratio analysis to determine the state-designated shortage areas. To be named a shortage area, the average standard score had to be 100 or more and the area had to show a shortage using the 1:1500 ratio.

The federal government uses an alternative shortage designation, the Health Professional Shortage Area (HPSA). The HPSA designation differs from the State Health Workforce Analysis because designation is voluntary and based on counties or larger areas, or populations within counties.

Endnotes:

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⁵ Council on Graduate Medical Education, *Improving Access to Health Care Through Physician Workforce Reform*. Washington, DC: US Department of Health and Human Services, October 1992.

⁶ California State University and FHP Foundation, "*Blueprint for Change: Health Care Education Reform*," Conference Proceedings, Long Beach, California, September 1994.

⁷ WAMI Rural Health Research Center, *Anti-trust Issues in Rural Washington State*, Olympia: Washington State Department of Health, Health Care Policy Board, Attorney General's Office, December, 1996.

HIV/AIDS

Definition: Infection with human immunodeficiency virus (HIV) results in a variety of manifestations becoming progressively more severe over time. AIDS, as defined by the Centers for Disease Control and Prevention (CDC), includes HIV infected persons with severe immunodeficiency (CD4 lymphocyte count < 200 cells/μl or < 14% of total lymphocytes) and/or 26 opportunistic infections (e.g., *Pneumocystis carinii* pneumonia), neoplasms (e.g., Kaposi's sarcoma) and other indicator conditions (e.g., wasting syndrome). ICD-9-CM (1994) code 042; ICD-9 codes 042.*, 043.1, 043.3.

Summary

In 1996, 659 AIDS cases were diagnosed among Washington State residents, for an annual incidence of 12 per 100,000. HIV was the second leading cause of death among men 35–44 years of age, accounting for 15% of deaths, and the third leading cause of death among men 25–34, accounting for 13% of deaths. In 1996, new antiretroviral drugs that slow the progression of HIV infection were introduced. As a result, new AIDS cases declined 15% and HIV-related deaths declined 33% from 1995. Between 9,000 and 11,000 people were estimated to be living with HIV infection in Washington in 1996.

Time Trends

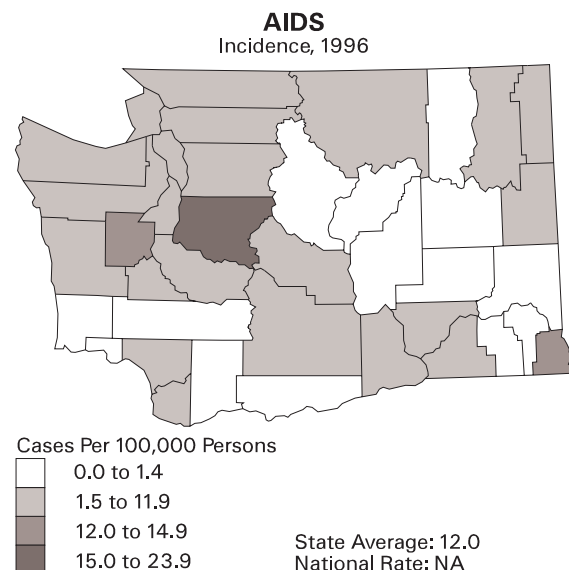
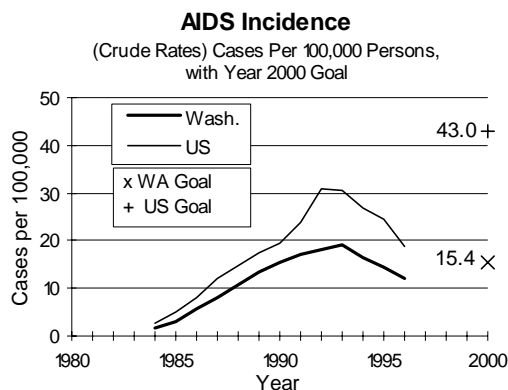
The first AIDS case in Washington was reported in 1982. Through 1993, AIDS incidence increased steadily, although the rate of increase slowed over time. In 1994, cases decreased for the first time. This 12% decrease was partly due to changes in the AIDS case definition in 1993 to include severe immunodeficiency in the absence of symptomatic illness. As a result, cases were reported earlier in the course of HIV infection. In addition, the decrease in AIDS cases in 1994 occurred principally among men who have sex with men (MSM) and probably reflects a decline in

risk behaviors. Seroprevalence studies from Seattle-King County, which show a decline in seroprevalence among MSM, also suggest that prevention efforts that have targeted this population since the mid-1980s have been effective.^{1, 2}

In 1996, 659 AIDS cases were diagnosed in Washington and reported as of November 30, 1997—a 15% decrease from the number diagnosed in 1995. This decline reflects advances in antiretroviral (ARV) therapy, including protease inhibitors, which slow the progression of HIV infection to AIDS and which were more widely used in 1996. The effects of these treatments were also evident in reduced mortality among AIDS patients; deaths due to HIV/AIDS declined 33% between 1995 and 1996.

Year 2000 Goal

Washington's goal for the year 2000 is 900 or fewer new AIDS cases annually (incidence not to exceed 15.4 per 100,000). This goal has been realized since 1994. With the advent of effective ARV therapy and the resulting decline in progression of HIV infections to AIDS, AIDS incidence is no longer a sensitive indicator for the



underlying incidence of HIV infection.

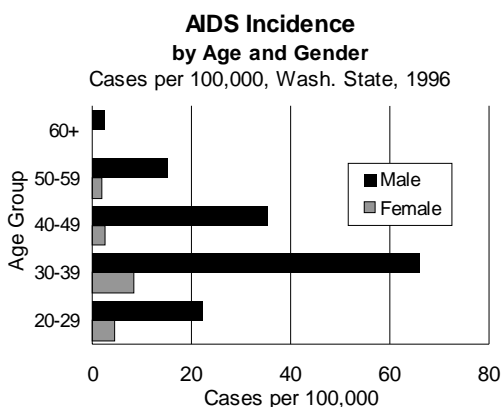
Geographic Variation

AIDS tends to be concentrated in urban areas. When rural counties show high rates, they are usually based on small numbers and are apt to fluctuate widely from year to year.

From 1994 through 1996, King County had the highest average annual AIDS incidence rate in the state (29.5 per 100,000). Other populous counties with relatively high rates were Clark, Pierce, and Snohomish. No cases were reported in Douglas, Ferry, Garfield, and Wahkiakum Counties.

In recent years, cases have declined more dramatically inside King County than outside. As a result, the proportion of Washington's AIDS cases diagnosed outside King County has grown from 21% in 1985 to 42% in 1996.

Age and Gender

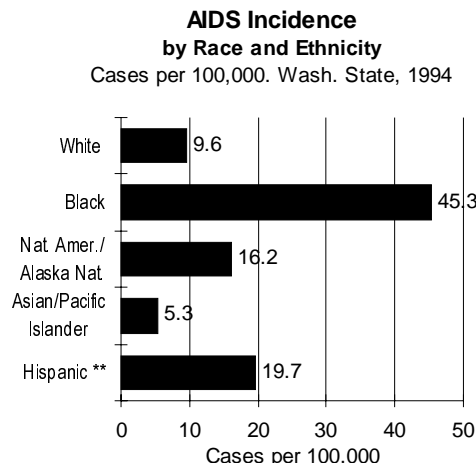


AIDS is primarily a disease of young adults, with a median age at diagnosis of 36 years. In 1996, AIDS was diagnosed in 584 men (median age: 36 years) and 72 women (median age: 35 years). Three children were diagnosed with AIDS; all were infected perinatally.

Ninety-four percent of all AIDS cases have been diagnosed among men. In recent years, cases among men have declined while cases among women have not. As a result, women account for an increasing proportion of AIDS cases. In 1985, women accounted for 2% of all AIDS cases; in 1996, they accounted for 11%.

Race and Ethnicity

Although the majority of AIDS cases in Washington State are among white non-Hispanics, racial and ethnic minorities have been disproportionately affected by the epidemic. This disparity by race/ethnicity is most noticeable in women. Among men diagnosed with AIDS in 1996, 76% were white, 11% were black, and 9% were Hispanic. Among women, 60% were white, 20% were black, and 10% were Hispanic.



** Hispanic is treated as a racial group by CDC.

Other Measures of Impact and Burden

HIV Seroprevalence. Estimates based on CDC projections suggested that between 9,000 and 14,000 Washington State residents were living with HIV infection in 1995.³ More recent estimates suggest that between 9,000 and 11,000 people may have been living with HIV infection in Washington in 1996.⁴

Anonymous seroprevalence studies at sexually transmitted disease clinics in King County show differing trends in HIV seroprevalence by risk population. Seroprevalence among MSM declined from 17% in 1991–1993 to 9% in 1994–1996.² HIV prevalence remained low (less than 1%) during every survey period among women and heterosexual men without a history of injection drug use. Among injection drug users (IDUs) and their heterosexual partners, seroprevalence was 3% or less in every survey period.

Anonymous seroprevalence surveys at drug treatment facilities have shown a stable seroprevalence among drug users of less than 2.5% in King County and less than 5.8% in Pierce County. Anonymous surveys at state correctional

facilities have shown a stable seroprevalence of approximately 1% among incoming male and female inmates, a rate higher than in the general population but lower than in persons with known risk factors for HIV infection.

The Survey in Childbearing Women, conducted statewide between 1989–1995, indicated an annual seroprevalence of less than 0.06%. Data also showed a significant increase in seroprevalence over the course of the survey.

Quality of Life. Before and after the onset of AIDS, HIV may cause significant morbidity from a variety of infectious diseases, cancers, and other illnesses of unknown cause. In persons receiving antiretroviral therapy, the high cost of treatment, the rigorous daily medication schedules, and the uncertainty of continued treatment success may impose substantial financial, physiological, and psychological burdens. In those who fail to respond to treatment or for whom the side effects are intolerable, the anticipation of chronic illness and untimely death and the fear of social stigmatization may lead to a sense of personal isolation, depression, anxiety, and other psychological sequelae.

Costs of Care. In 1993, prior to recent advances in ARV therapy, the lifetime cost of medical care for a person with HIV was estimated to be \$119,000.⁵ Data from the Comprehensive Hospital Abstract Reporting System (CHARS) show that AIDS patients in Washington State accounted for 12,671 hospital days at a total cost of over \$19.9 million in 1995. The proportion of discharges for which Medicare or Medicaid was the primary payer rose from 35% in 1988–89 to 49% in 1995.

The anticipated cost-savings from reduced hospitalizations resulting from ARV therapy is offset by the expensive drug regimens, which typically cost \$9,000–\$12,000 annually per patient. As more HIV-infected patients are given these drugs earlier in their infections, enrollment in the state's AIDS Drug Assistance Program has increased. This program, which provides HIV-related medications to low income HIV-positive Washington residents who do not qualify for Medicaid benefits, served an average of 358 clients per month during 1996, an increase of 96% from 1995. The program's estimated budget for FY 1997 was \$6.8 million.

Mortality. In 1996, HIV was the second leading cause of death among men 35–44 years of age, accounting for 15% of deaths, and the third leading cause of death among men 25–34, accounting for 13% of deaths. Among women 25–34 years of age, HIV was the fourth leading cause of death, accounting for 4% of deaths.

Risk and Protective Factors

Sexual Intercourse. While HIV can be transmitted in a single act of sexual intercourse, it is not transmitted with every act of sexual intercourse. The risk of HIV transmission during unprotected sexual intercourse with a seropositive person has been estimated to be from 1 in 10 acts of unprotected sexual intercourse to 1 in 1,000. Risk is increased for anal and vaginal intercourse, by the presence of other sexually transmitted diseases, for receptive or female partners, and for persons with multiple partners. Correct and consistent use of latex condoms virtually eliminates the risk of sexual transmission of HIV.

Sharing Injection Equipment. HIV can be transmitted through the use of HIV-contaminated needles and syringes, a risk most commonly associated with injection drug use. It has been estimated that 0.5% to 1.5% of the adult Washington population has used illicit injection drugs at some point during their lifetimes.⁶ Next to stopping the practice of injecting drugs, the consistent use of new or unshared equipment is the most effective method of reducing the risk of HIV infection. Proper cleaning and disinfection of all equipment associated with needle use can also reduce the risk.

Maternal Transmission. HIV can be transmitted to the fetus during pregnancy or to the infant during or shortly after birth. The rate of maternal transmission in pregnant women not receiving the antiretroviral drug zidovudine (AZT) has been estimated at 25–30%. Early identification of the mother's infection and treatment with AZT can reduce the number of HIV-infected infants by two-thirds.

Other Transmission Routes. Transmission of HIV through blood transfusions and improper or accidental breakdown of infection control practices now rarely occurs.

High-risk Populations

Groups of people considered at greater risk for HIV infection because of higher prevalence of HIV infection or frequency of risk behaviors or both include MSM, IDUs, heterosexual partners of MSM and IDUs, African Americans, Hispanics, Native Americans, and youth.

Seventy-one percent of the AIDS cases in Washington have been among MSM. Although the majority of cases continue to be diagnosed among MSM, the number of cases in this community has fallen. The number of cases among IDU increased through 1995, and cases among heterosexual contacts of persons with HIV continued to increase through 1996. As a result, between 1985 and 1996, the proportion of AIDS cases among MSM decreased from 92% to 60%, cases among IDU increased from 2% to 12%, and cases among heterosexual contacts of persons with HIV increased from 0% to 9%.

Intervention Points, Strategies, and Effectiveness

Primary AIDS prevention relies on a comprehensive strategy of education, enhanced access to protective devices and medical supplies (including AZT for HIV-infected pregnant women and ARV), and a variety of public health interventions to reduce risk behaviors. To be most cost-effective, interventions need to be directed toward persons whose behavior or personal circumstances place them at increased risk for infection with HIV or other sexually transmitted diseases. Research has demonstrated certain characteristics common to successful HIV prevention programs.⁷ Behavior change is facilitated by training in assertiveness, refusal skills, communication skills with sexual partners regarding safer sex practices, and behavioral self-management. The most effective interventions are those that are appropriate for the person's developmental stage. Intensive and sustained interventions are more likely to lead to sustained behavior change.

Community interventions, which target groups of people (often defined by sex, geography, risk behaviors, race/ethnicity, or sexual orientation), can lead to significant reductions in individual risk behaviors.⁸ Modification of community norms regarding sexual safety appears to decrease high-risk sexual behavior.

Primary prevention also depends upon the widespread availability and promotion of protective devices and equipment, such as sterile syringes, bleach kits, and latex condoms. Because infection with other sexually transmitted diseases can facilitate transmission of HIV, effective control of these diseases is a prevention strategy for HIV.

Secondary prevention of AIDS is directed at slowing the progression of disease among HIV-infected persons. Prophylactic treatment to prevent opportunistic infections can slow the progress of HIV infection to AIDS, and ARV therapy has clinical benefits for many patients. Among persons with AIDS who were interviewed since 1997 through the Supplemental HIV/AIDS Surveillance (SHAS) project, 98% had received ARV drugs to treat their HIV infection and of these, 61% were currently taking a combination of three drugs that included a protease inhibitor.⁹

Due to successful secondary prevention efforts, AIDS case reporting is no longer sufficient to track the magnitude or distribution of HIV infection. A confidential HIV case reporting system would improve our understanding of the epidemic, help to target prevention and public health services, provide a better link to health and social services, and result in more efficient allocation of resources.

Data Sources

State AIDS data: Washington Department of Health, Office of Infectious Disease and Reproductive Health.

National AIDS data: Public Health Service, Centers for Disease Control and Prevention.

State death data: Washington Department of Health, Center for Health Statistics.

State hospitalization data: Washington Department of Health, Office of Hospital and Patient Data Systems.

AIDS Drug Assistance Program data: Washington Department of Health, Office of Infectious Diseases and Reproductive Health.

For More Information

Washington State Department of Health, Infectious Disease and Reproductive Health Assessment Unit, (360) 236-3416.

Endnotes:

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⁴ CDC: Update: Trends in AIDS Incidence—United States, 1996. *Morbidity and Mortality Weekly Report* 1997; 46:861-867.

⁵ Hellinger FJ. The lifetime cost of treating a person with HIV. *Journal of the American Medical Association* 1993; 270:474-478.

⁶ Stehr-Green J and Courogen M. *Washington State HIV/AIDS Epidemiologic Profile—1996*. Olympia: Washington State Department of Health, Infectious Disease and Reproductive Health Assessment Unit, p. 39.

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⁸ Kelly JA, St. Lawrence JS, Stevenson LY, et al. Community AIDS/HIV risk reduction: The effects of endorsements by popular people in three cities. *American Journal of Public Health*; 1992; 82:1483-89.

⁹ Courogen M. Antiretroviral therapy use by SHAS interview respondents: Preliminary results from the preventive therapy module. *HIV/AIDS Quarterly Epidemiology Report*. Washington State Department of Health, and Seattle-King County Department of Public Health. Olympia: 3rd Quarter, 1997, 20-23.

Osteoporosis

Definition: Osteoporosis is a bone disease characterized by low bone mass and deterioration of bone tissue that leaves bones fragile and susceptible to fracture. The World Health Organization defines osteoporosis as a bone mineral density 2.5 standard deviations below the normal adult mean. Hip fracture, an indicator of osteoporosis, is measured using hospitalizations among people age 65 and older hospitalized at acute care hospitals in Washington for a principal diagnosis of hip fracture. ICD code: (hip fracture) 820.

Summary

In Washington, between 555,200 and 645,000 residents may have low bone mass or osteoporosis. Approximately 30,000 fractures are attributed to osteoporosis annually, the most serious of which are hip fractures. In 1996 there were 4,801 hospitalizations for hip fracture among residents aged 65 and older, a rate of 754 per 100,000 persons in that age group.

Osteoporosis is not a normal part of aging and is largely preventable through a balanced diet with adequate calcium and vitamin D, regular weight-bearing exercise, smoking cessation, and limited alcohol intake. Hormone replacement therapy is also considered for some postmenopausal women.

Time Trends

Osteoporosis is most prevalent among aging persons. In Washington, and throughout the United States, the population is getting older. In 1996, 636,906 Washington citizens were age 65 years or older. From 1980 to 1996, the number of persons in this age group increased by 45%, with the greatest increase (71%) occurring among persons 75 or older. By comparison, the general population increased by 32% during this period.

Hip fracture, one of the most severe

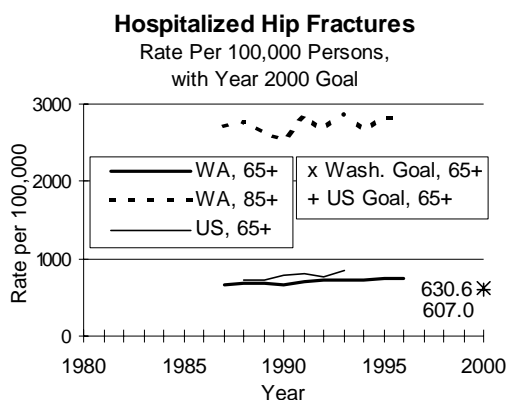
manifestations of osteoporosis, is an indicator of the impact of osteoporosis. (See technical notes.) From 1980 to 1996, Washington's rate for hip fracture hospitalizations among people aged 65 and older increased from 661 to 754 per 100,000. In the United States, the rate for this age group increased from 714 per 100,000 in 1988 to 841 per 100,000 in 1993. These rate increases reflect an increase in the average age of persons 65 years and older (i.e., an increasing proportion of the population 65 years and older is now 85 years and older).

The current trend toward aging of the population is not likely to change for several decades. As a result, osteoporosis and other conditions of the elderly will have substantial effects on the health care system and the quality of life in Washington.

Year 2000 Goal

Healthy People 2000 goals for the nation related to osteoporosis are to reduce hip fractures among the elderly so that hospitalizations for this condition are no more than 631 per 100,000 among persons 65 years of age and older and no more than 2,225 per 100,000 among women 85 years and older. In 1996, Washington State rates related to these goals were 754 per 100,000 and 3,133 per 100,000, respectively, both of which were well above the national targets.

Healthy People 2000 goals related to osteoporosis risk reduction include decreasing the proportion of adults who are physically inactive to 42% and the proportion who are sedentary to 12%. In 1994, 48% of Washington adults were inactive and 18% were sedentary. Healthy People 2000 goals for leisure time activity among persons age six and older, calcium intake, and counseling on estrogen replacement therapy for perimenopausal women are also related to osteoporosis risk reduction; however, we lack Washington data with

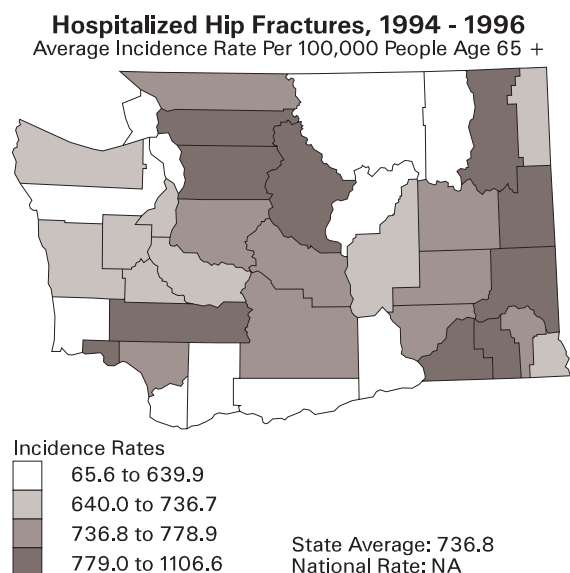


which to compare our progress toward achieving these national goals.

Geographic Variation

In 1996, two-thirds of hip fracture patients aged 65 and older resided in one of the six most populous counties: King (1362 cases), Pierce (503 cases), Spokane (453 cases), Snohomish (429 cases), Yakima (220 cases), or Clark (184 cases). The number of hip fractures for Clark County may be underreported because Clark County residents often seek medical treatment at hospitals in Oregon, which are not included in this analysis.

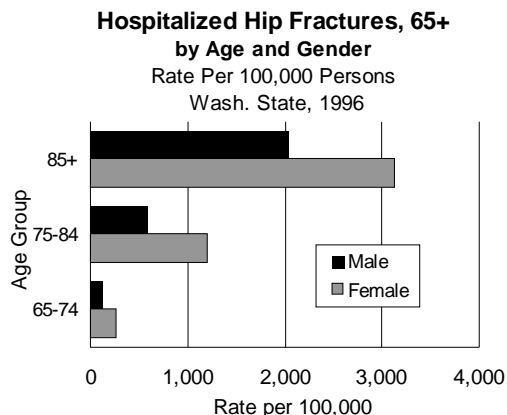
From 1994–1996, the counties with the highest hip fracture hospitalization rates were



Wahkiakum, Lewis, Columbia, Stevens, Whitman, Walla Walla, Spokane, Chelan, Skagit, and Snohomish. The counties with the lowest rates were Skamania, Klickitat, San Juan, Island, Jefferson, Pacific, Douglas, Clark, Ferry, and Benton. The reader should be cautious in interpreting county rates because some are based on small numbers and may not be stable over time.

Age and Gender

The incidences of osteoporosis and related hip fractures are strongly associated with age and gender. After age 50, the risk of hip fracture increases exponentially with age; at all ages, women are at greater risk for hip fracture associated with osteoporosis than are men. Women 85 years or older have the highest rate.



Other Measures of Impact and Burden

Prevalence of Osteoporosis and Fractures at Other Sites. Nationally, among persons 50 years of age and older, 20–50% of women and up to 25% of men are affected by osteoporosis.¹ In Washington, a conservative estimate of between 555,200 and 654,000 residents had low bone mass in 1995. This estimate is based on the national estimated rate of osteoporosis applied to the demographics of the Washington State population. Approximately 30,000 fractures are attributable to osteoporosis each year. In addition to fractures of the hip, 4,000 vertebral fractures, 5,000 distal forearm fractures, and 6,000 fractures at other limb sites also occur.

Quality of Life. The impact from fractures in terms of mobility loss and loss of independence and in medical costs does not end with hospital discharge. Following a hip fracture, 10–20% of patients die within six months, 50% will be unable to walk without further assistance, and 25% will require long-term domiciliary care.¹ It is unclear, however, what proportion of the subsequent morbidity/mortality is due exclusively to the hip fracture or a simultaneously occurring condition.

Falls and fractures resulting from osteoporosis affect more than a person's physical health: they also affect emotional well-being. Fear of falling can set off a chain of debilitating events. Reduced physical activity weakens muscles. Reluctance to engage in social activities increases isolation and leads to loss of confidence in the ability to function independently and increases the need for assistance. Between 10% and 20% of persons who have fallen say they avoid activities such as shopping or housekeeping because of their fear of

additional falls or injury.² Falls and instability are mentioned as a contributing factor in 40% of nursing home admissions.³

Risk and Protective Factors

Internal Risk Factors. Internal or physiologic risk factors for osteoporosis include having a family history of this condition or relatives who lost height with age, suffered vertebral, hip, or wrist fractures, or developed a hunch back. As a group women (compared to men), and whites, Native Americans, or Asians (compared to African Americans) are at greater risk for osteoporosis. Other internal risk factors include difficulty absorbing calcium, early menopause, abnormal absence of menstruation (amenorrhea), and low testosterone in men.

External Risk Factors. Several external or behavioral risk factors affect the rate and amount of bone loss. These include cigarette smoking, excessive alcohol intake, sedentary lifestyle, low calcium diet, anorexia or bulimia, and use of certain medications such as steroids, anticonvulsants, excessive thyroid hormones or certain cancer medications.⁴

Many osteoporosis risk factors are relatively common among Washington's adult residents.

Protective Factors. Weight-bearing activity such as walking, running, dancing, and tennis increases bone mass even in the elderly.⁵ Studies show that physical activity positively effects both bone development in childhood and adolescence and bone maintenance in early adulthood.⁶ Other protective factors include adequate dietary calcium and vitamin D intake throughout life. Nutrition appears to be most influential during bone development in the prenatal stage, adolescence, and in the elderly years.⁷ At most skeletal sites, peak bone mass is reached by the age of 18. Estrogen replacement following surgical removal of the ovaries or menopause reduces bone loss.⁸

Prevalence of Selected Risk Factors for Osteoporosis Among Adults in Washington State, 1995

Risk Factor	Proportion with Specific Risk Factor		
	Males	Females	Total
Age ^a			
65–74 yrs	5.9	7.0	6.4
75–84 yrs	3.2	4.6	3.9
85+	0.7	1.8	1.3
Race ^b			
White	---	---	84.7
Smoking ^c			
Ever	54.5 (51.8–57.4) ^d	45.3 (42.9–47.8)	49.8 (48.0–51.7)
Current	20.1 (17.8–22.3)	20.3 (18.3–22.2)	20.2 (18.7–21.7)
Drinking			
Acute binge ^e	19.3 (17.1–21.5)	7.8 (6.5–9.1)	13.4 (12.2–14.7)
Chronic ^f	5.1 (3.8–6.3)	0.5 (0.2–0.9)	2.8 (2.1–3.4)
Sedentary lifestyle ^g	49.1 (46.4–51.9)	46.0 (43.5–48.4)	47.5 (45.7–49.4)

^a % distribution based on total population (not just adults)

^b based on 1994 population estimates

^c ever smoked 100 cigarettes in lifetime (1995 Washington State Behavioral Risk Factor Surveillance System)

^d 95% confidence interval

^e 5 or more alcoholic beverages on one or more occasions in the last months (1995 Washington State Behavioral Risk Factor Surveillance System)

^f on average 2 or more alcoholic beverages per day from 1995 Washington State Behavioral Risk Factor Surveillance System

^g no physical activity or physical activity that was done 20 minutes or less fewer than 3 times per week (1994 Washington State Behavioral Risk Factor Surveillance System)

High-risk Groups

Groups at particularly high risk for osteoporosis include:

- Adult white or Asian women aged 50 years or older, especially those who are slender with small bones
- Heavy drinkers
- Persons with sedentary lifestyles
- Cigarette smokers
- Women who have gone through early menopause or have had their ovaries surgically removed.

Intervention Points, Strategies, and Effectiveness

The prevention of osteoporosis is a lifelong undertaking with two major objectives: the achievement of optimal peak bone mass and the maintenance of bone mass. Successful prevention

efforts require assessment, education and, when appropriate, interventions to reduce known risk factors. Early identification of those at risk and those who may have the disease is critical to successful intervention.

Primary Prevention. Primary prevention includes identifying and addressing preventable risk factors. Education programs directed at the following have shown promise:

- Eating a balanced diet with adequate calcium and vitamin D intake throughout life.⁹
- Increasing weight-bearing physical activity.¹⁰
- Considering hormone replacement therapy for eligible postmenopausal women after weighing the risks and benefits.¹¹
- Reducing falls among the elderly.^{12, 13}
- Reducing smoking and alcohol intake.

Efforts to establish public education/promotion programs ensure the availability of these programs to all communities at risk. Health promotion activities that broaden public and private partnerships in risk-factor prevention and control are desirable because they expand what can be accomplished through public efforts alone and sustain improvements.

Treatment Interventions. Treatments for osteoporosis are designed primarily to reduce further bone loss and limit adverse effects of the disease. Hormone replacement therapy can both prevent and treat osteoporosis, but should be considered only after weighing the benefits and risks of therapy. New drugs such as RaloxifeneTM, AlendronateTM, CalcitoninTM which act by decreasing bone resorption or increasing bone density have recently been approved by the FDA for the treatment of postmenopausal osteoporosis. Early bone density screening for those who are at high risk or who exhibit signs of the disease allows initiation of treatment as early as possible. Policy development that ensures the availability of affordable bone density testing and coverage for treatment of high-risk persons facilitates early diagnosis and treatment.

Assessment. Accurate and timely health information on risk factors for or indicators of osteoporosis allows the monitoring of trends and the identification of high-risk populations. This information can be used to identify effective strategies for health promotion and early intervention.

Data Sources

State hip fracture hospitalization data: Washington State Department of Health, Hospital and Patient Data. Prepared by DOH Injury Prevention Program.

National hip fracture hospitalization data: National Center for Health Statistics.

State risk factor data: Washington State Department of Health, Behavioral Risk Factor Surveillance System.

For More Information

Washington State Department of Health, Office of Health Promotion, (360) 236-3702.

Technical Notes

Although people 65 years of age and older who are hospitalized with hip fractures represent only a small portion of the total population with osteoporosis, these data can be used to monitor trends in osteoporosis. This is because most of these fractures are associated with osteoporosis and characteristics (with respect to age and gender) of these people are similar to those with other manifestations of osteoporosis. In addition, hip fractures almost always require hospitalization and, thus, are easily identified and counted.

Endnotes:

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¹⁰ Drinkwater B. Weight-bearing exercise and bone mass. *Physical Medicine and Rehabilitation Clinics of North America* 6(3), August 1995.

¹¹ Schneider D, Barrett-Connor E. Timing of postmenopausal estrogen for optimal bone mineral density. *Journal of the American Medical Association* 277(7), February 1997.

¹² Tinetti M, Baker D, McAvay G, Claus E, Garrett P, et al. A multifactorial intervention to reduce the risk of falling among elderly people living in the community. *The New England Journal of Medicine* 331(13), 1994.

¹³ Campbell J, et al. Randomized controlled trial of a general practice programme of home based exercise to prevent falls in elderly women. *The British Medical Journal* Vol. 315, October, 1997.

New Indicators

Antibiotic-Resistant Infections

Definition: A microbial infectious agent that demonstrates resistance against antibiotics to which that particular species was previously susceptible.

Summary

Antibiotic resistance has been identified in a variety of organisms. In the United States, antibiotic-resistant organisms of concern include tuberculosis with resistance to multiple antibiotics (MDRTB), gonorrhea, methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *S. aureus*, vancomycin-resistant enterococci (VRE), drug resistant *Streptococcus pneumoniae* (DRSP), and human immunodeficiency virus (HIV) resistant to multiple antiviral drugs. Internationally, MDRTB and antibiotic-resistant malaria and cholera are health threats.

Time Trends

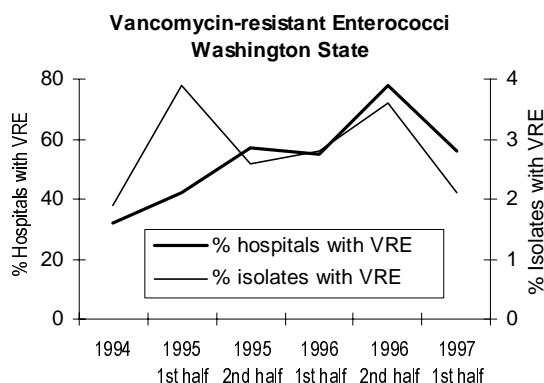
Antibiotics were initially thought of as “magic bullets,” but gradually their microbial targets have become less vulnerable. In the United States during the 1960s, methicillin-resistant *S. aureus* emerged and *S. pneumoniae* first began to show penicillin resistance. Resistance to antibiotics was found in gonorrhea in the 1970s. In the 1980s, MDRTB and VRE were identified. Nationally, surveillance data showed that the proportion of hospital enterococcal isolates with vancomycin resistance increased from 0.3% in 1989 to 7.9% in 1993. The prevalence of penicillin resistance of *S. pneumoniae* is as high as 30% in some parts of the

United States. However, such surveillance data are limited and the extent of antibiotic resistance is not well defined.

In Washington, although not in every state, all available tuberculosis (TB) isolates are tested for drug sensitivity. In 1996, resistance to at least one antituberculosis drug was found in 32 of 204 isolates (16%) tested in Washington; there were only three cases of multiple drug resistance. Additional types of resistance patterns were found for TB isolates, particularly resistance to isoniazid (INH) or to INH and at least one additional anti-tuberculosis medication other than rifampin (typically streptomycin). In 1996, there were six cases resistant only to INH and 11 cases resistant to INH as well as other drugs. Cases of documented resistance in Washington are probably attributable to incomplete courses of drug treatment for TB infection. This likelihood is consistent with the fact that most (about 75%) resistant cases are among foreign-born persons, particularly those from Asian countries where treatment courses are often incomplete.

Surveillance data are even more limited for other resistant organisms. In Washington, surveillance has been conducted for VRE through about 20 sentinel hospitals for 1994 through 1997. An increasing proportion of participating hospitals have identified VRE during each successive six-month surveillance period. The proportion of enterococcal isolates that demonstrate vancomycin resistance fluctuates between 2% and 4% of isolates tested.

In 1995, gonorrhea with high-level fluoroquinolone resistance was first reported in Seattle and Colorado. In 1996, 30% of the gonococcal isolates submitted from a single clinic site in Seattle were resistant to penicillin and tetracycline. Infrequent resistance is also found for other drugs (including cefixime, ceftriaxone, and fluoroquinolones), which are sometimes used as treatment options, although they are not



recommended by the national Centers for Disease Control and Prevention (CDC). Ongoing surveillance for resistant strains of gonorrhea is done through the gonococcal isolate surveillance project located in Seattle.

In 1997, the Washington State Department of Health began collecting information on all *S. pneumoniae* isolates from blood and cerebrospinal fluid from 27 selected sentinel hospitals in the state. The period of collection has been too short to identify any definitive trends in the incidence or distribution of DRSP, but 11 (41%) of 27 such pneumococcal isolates showed decreased susceptibility and 6 (22%) were fully resistant to penicillin; in comparison, a study conducted between 1992 and 1995 found only 1 (0.8%) of 125 blood and cerebrospinal fluid isolates from the Puget Sound region was fully resistant to penicillin.

Year 2000 Goal

No goals were established for the year 2000.

Geographic Variation

As a generalization, antibiotic-resistant organisms are more common in heavily populated urban areas. The organisms can spread over a region through movement of people and transfers of patients among health care institutions.

As a general rule, antibiotic resistance typically begins in populations with high exposure to antibiotics or high rates of suboptimal antibiotic treatment. However, the settings vary by specific organism; for example, MDRTB was first identified in populations with incomplete treatment of tuberculosis, while MRSA and VRE originated repeatedly in hospitalized patients receiving multiple courses of antibiotics and are passed from person to person. In Europe, VRE resistance is associated with the use of antibiotics in animal feeds. The emergence of DRSP has occurred in the community rather than in the hospital. National surveillance data have shown significant variation in the prevalence of DRSP in several cities.

Other Measures of Impact and Burden

Medical Care Costs. When the first-choice antibiotic is no longer effective, more expensive antibiotics may be needed and the number and/or

duration of hospital stays may increase. As just one example, the cost of pneumococcal infections has been estimated at over \$4 billion yearly in the United States. The emergence of DRSP will make treatment of pneumococcal meningitis, bloodstream infections, pneumonia, and middle ear infections more difficult and more costly.

Treatment of MDRTB is ten times more expensive than treatment of drug-susceptible tuberculosis. Similarly, the costs for treating gonorrhea have also increased due to antibiotic resistance against less expensive, first-choice drugs. In addition, control of resistant organisms increases infection control and housekeeping costs within a health care facility.

Morbidity and Mortality. Antibiotics needed to treat drug-resistant infections may be more toxic and less effective. Infections due to MDRTB, MRSA, DRSP, and VRE may be life-threatening due to limited therapeutic options.

Facility Transfers. Patients with antibiotic-resistant infections may have greater difficulty in transferring between facilities, for example from one hospital to another hospital or to a nursing home closer to their family, thereby putting additional emotional and health care cost burdens on patients and their families. Inability to transfer patients also places financial burdens on health care institutions.

Risk and Protective Factors

Risk factors vary depending on the organism. In general, risk increases with increasing frequency of use of antibiotics, susceptibility to infections (compromise of either immunological or physical protections), and exposure to other persons colonized or infected with drug-resistant organisms.

In addition to these risk factors that affect individuals' chances of developing antibiotic-resistant infections, there is growing evidence that we are creating population-based pressures that facilitate the development of antibiotic resistance; for example, through indiscriminate use of prophylactic antibiotics, reimbursement policies which favor the use of vancomycin and other antibiotics in inappropriate settings, parental demand for unnecessary antibiotics to treat viral infections, and the introduction of antibiotics into the food chain through their use as growth-promoting agents in agricultural settings.

High-risk Groups

High risk groups also vary depending on the organism. Persons in a hospital or long-term care facility are at greater risk for MRSA or VRE infections. MDRTB and resistant HIV are more common among persons with interrupted medical care, such as the homeless or injecting drug users. Risk factors for DRSP include day care attendance and recent antibiotic use.

Intervention Points, Strategies, and Effectiveness

Resistance patterns will vary both temporally and geographically, and may change rapidly in a given area. Ongoing surveillance is necessary to characterize antibiotic-resistant organisms at the local level and to enable the application of targeted, timely interventions.

Person-to-person spread of resistant organisms is the main means of transmission. Within hospitals and long-term care facilities, staff may be responsible for transmitting VRE and MRSA among patients. HIV and drug-resistant gonorrhea are sexually transmitted. Tuberculosis can be spread by untreated or incompletely treated cases. Each of these situations can be addressed by different public health interventions.

Health care providers can be involved with controlling the development and spread of antibiotic-resistant organisms through surveillance, good infection control practices, appropriate treatment (especially appropriate use of antibiotics), and vaccination. The specific approach will vary depending on the organism. Optimal infection control practices in institutions are essential.

Directly observed therapy is recommended to ensure completion of tuberculosis treatment and reduce the development of drug resistance. Strategies have been formulated for judicious use of antibiotics, particularly for empirical or prophylactic use, and for surveillance for DRSP, MRSA, and VRE. Existing institutional pressures such as reimbursement for use of certain antibiotics should be evaluated and, when appropriate, changed. The prudence of antibiotic use in veterinary or animal husbandry settings should also be evaluated.

Other approaches include educating parents about appropriate use of antibiotics to reduce requests for unnecessary treatment. CDC and the

American Academy of Pediatrics have developed such educational material for parents.

For More Information

Washington State Department of Health, Communicable Disease Epidemiology Section, (206) 361-2914.

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Childhood Dental Caries

Definition: Dental caries (or cavities) is an infectious disease caused by *Streptococcus mutans*. These bacteria, which adhere to tooth surfaces, produce acid from carbohydrates and demineralize inorganic tooth components such as enamel and dentin, resulting in caries.

Summary

Dental caries (or cavities) is an infectious disease process that affects 84% of all children by the age of 18 years.¹ Severe disease, however, is concentrated in relatively few persons, as 20% of children experience 80% of dental caries. Children from low-income families, children of Hispanic, American Indian, and Asian heritage, and children whose parents do not speak English in the home are at highest risk, presumably because these children have limited access to dental care. Medicaid spent almost \$40 million providing dental services in Washington for children in 1997.

Effective interventions should be age-specific and start early in life. Interventions include well-established use of fluoride and other sealants, and newer approaches such as combating microorganisms with chemicals and promoting sugar substitutes in the diet.

Time Trends

Nationally, over the past 20 years, the prevalence of caries in children 0–18 years has declined in all regions of the country; however since 1986, the prevalence among children 6–8 years of age has remained stable. During 1988–1991, 54% of 6–8-year-old children and 67% of adolescents 15 years old had evidence of caries.

Trend data are not available in Washington State. Based on the 1994 Washington State Smile Survey of low-income populations (see Technical Notes), the prevalence of caries was 38% among Headstart/Early Childhood Education and Assistance Program (ECEAP) children, 46% among 6–8-year-old children, and 57% among adolescents age 14–16 years. The rate of early childhood caries (also known as “baby bottle tooth decay”) in Head Start/ECEAP children was 13%.

Year 2000 Goal

Washington’s year 2000 goal is to reduce the prevalence of caries to 30% among Headstart/ECEAP children, 35% for children 6–8 years old, and 50% among adolescents 14–16 years old. The state goal for early childhood caries among Headstart/ECEAP children is 5%. Considering the results of the 1994 Smile Survey, there is a long way to go to meet these goals.

Geographic Variation

Currently, data are scant at the regional or county level. A 1994 University of Washington survey of third-grade children that measured the number of decayed, missing, and filled tooth surfaces were measured (See technical notes.), showed substantial variability in dental disease rates from school to school. No distinct geographic pattern was noted.

Age and Gender

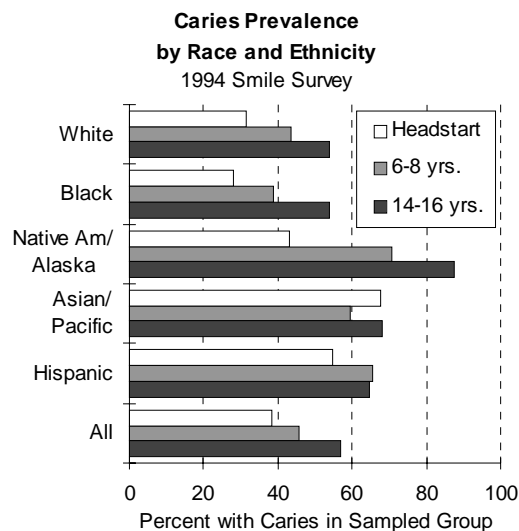
Some research has shown that children at the age of 22 to 26 months acquire *Streptococcus mutans*, the bacterium that causes dental caries, from parents or care providers.² Recent studies suggest that bacterial colonization may occur even earlier, before the age of 6 months.³ The proportion of children with caries in primary and permanent teeth increases with age, as demonstrated in the 1994 Smile Survey. In contrast, rampant decay (which is defined as caries in seven or more teeth) appears to be more prevalent in younger age groups. In Washington, 11.2% of Headstart/ECEAP children had evidence of rampant caries. Among 6–8-year-old children, this rate decreased slightly to 10.9% and in age 14–16 the rate was 8.7%.

Although no data are available for Washington State, girls generally experience higher rates of caries than boys. The difference is small and may

be due to the earlier eruption of teeth in girls which puts them at risk earlier and for a longer time.

Race and Ethnicity

Based on data from the 1994 Smile Survey, the prevalence of dental caries among Headstart/ECEAP children, children 6–8 years, adolescents 14–16 years was higher for Asian, Hispanic, and American Indian children compared to White or African American children.



Income and Education

Washington data that associate levels of income and education with rates of dental disease in children are not available. Associations have been shown between enrollment in federally subsidized school lunch programs and higher rates of caries. Studies in industrialized countries show a consistent pattern of higher caries rates, more untreated decayed teeth, and more missing teeth among children of low socioeconomic status in comparison to children of high socioeconomic status in the same countries.⁴ In the National Health and Nutrition Examination Survey III (NHANES III, 1988–1991), 62% of children age 6–8 years whose parents had less than a high school education had experienced dental caries compared to the overall rate of 54% for that age group.

Other Measures of Impact and Burden

Social Impact. Conditions of the mouth and teeth such as caries, missing teeth, severe

malocclusion, and other oral infections may produce facial deformities and feelings of embarrassment or withdrawal in children. Teachers and parents have lower expectations of children with oral or facial deformities regardless of a child's intellectual abilities.⁵ Development of speech and communication may be adversely affected by poor oral health. In 1989, dental visits or problems resulted in 117 hours missed from school per 100 school-aged children or 51 million hours of lost school time.⁶

Illness. Oral infections have been identified as the source of serious eye, throat, respiratory, digestive, and heart conditions of a bacterial nature.⁷ Children may suffer impaired nutrition as a result of dental pain or dysfunction.

Cost. Dental disease is not self-limiting. The longer treatment is delayed, the more extensive and costly treatment of the disease becomes. Whereas a preventive and noninvasive sealant application costs \$22 per tooth, that same tooth allowed to deteriorate over time may incur restorative treatment in the form of a filling at a cost of \$70; left to decay further, the same tooth may require a stainless steel crown costing \$130, and then perhaps a root canal at a cost of \$855. Medicaid spent \$16 million on restorative dental services versus \$9.5 million on preventive services in 1997. Overall, \$40 million was spent providing dental services for children.

Hospitalization. Young children, often between the ages of 2–5 years, may be affected by early childhood caries that require hospitalization. The cost of this treatment, as reported by Children's Hospital and Regional Medical Center, is approximately \$3000 per child.

Risk and Protective Factors

Individual Factors. Factors specific to an individual that may affect whether a child is susceptible to tooth decay. These factors include:

- levels of bacterial flora (particularly *S. mutans*);
- flow rate and buffering capacity of saliva;
- individual immune factors; and
- patterns of food ingestion.

Children of mothers with a high level of *S. mutans* bacteria may be at higher risk of infection with the bacterium in infancy than are children of mothers with low levels and, thus,

would be at greater risk for the development of caries.⁸

Sealants and Fluoride Treatments. Use of sealants and fluoride treatments increases the resistance of teeth to caries. The children at highest risk for dental disease receive the least preventive dental care. Only 33% of Medicaid-enrolled children use dental services. Studies of children in low-income families show that only 19% of 7-year-olds and 30% of 8-year-olds have dental sealants on their permanent first molars. Overall, compliance with fluoride supplement regimens is poor.

Access to Fluoridated Water Systems. Fluoride has long been proven to raise the resistance of tooth structure to the acids that cause decay. A survey of U.S. school children showed a 39% lower caries prevalence in 5-year-old children with a history of continuous residence in optimally fluoridated communities.⁹ Fewer than 50% of Washington residents drink from fluoridated systems.

High-risk Groups

Severe dental caries is concentrated in relatively few children. Based on the 1994 Smile Survey, 20% of children in Washington State experience 80% of the dental disease found in screenings, a finding similar to national survey results. A high risk for development of caries is associated with poverty, residence in rural areas, and being of Hispanic, Asian, or American Indian race or ethnicity. In Washington, children of parents who do not speak English also experience higher rates of dental caries than do other children.

Intervention Points, Strategies, and Effectiveness

Childhood dental caries are preventable. Recognition that caries is an infectious disease of bacterial origin has focused research on treating dental disease with a medical model that addresses the clinical manifestation of disease and the cause of the disease process or causative organisms instead of the traditional surgical model of removing the infected tooth structure and replacing it with artificial materials. The National Institute of Dental Research has focused on a three-pronged strategy to be enhanced by improved delivery systems and public awareness:

- combating caries-inducing microorganisms;
- modifying caries-promoting ingredients of the diet; and
- increasing the resistance of teeth to caries.

Interventions for Individual Patients. Several chemical therapeutic approaches have been studied, primarily in Europe, with encouraging results. Chlorhexidine mouthwashes, varnishes, and gels have been used against the *S. mutans* bacteria with some effectiveness.¹⁰ Sugar substitutes such as sorbitol and xylitol have been promoted to modify high-sucrose diets, and thereby lower bacterial production of damaging acids. Fluoride treatments increase the resistance of teeth to decay; vehicles for fluoride use include supplements, drinking water, topical gels, toothpaste, varnishes and sealants, among others. Sealants, when applied to newly erupted permanent molars, provide an effective barrier to the bacteria and by-products that decay the chewing surfaces of teeth.

Public Health Interventions. Studies over the past 53 years demonstrate that optimal fluoridation of water systems can reduce caries in children by as much as 60% and in adults by 35%. Depending on the size of a community, fluoridation costs an average of 20–50 cents per person per year. The National Institutes of Dental Research estimated that nearly \$40 billion was saved nationally on dental treatment costs in the 1980s because of improvements in oral health attributable to the widespread use of fluorides and increased use of preventive services by practitioners.

Although public education and promotion of preventive oral health activities are widespread, successful outcomes are more likely to occur with specific preventive interventions targeted to those children at highest risk for developing caries. Effective interventions include:

- applying sealants for second-grade children in targeted schools;
- providing fluoride supplements and topical fluoride applications for infants and young children;
- screening children at age one year to identify high-risk children for follow-up with preventive fluoride regimens; and
- screening high-risk pregnant women with referral for dental treatment to control

levels of *S. mutans* that may be transmitted to their infants.

In addition, increasing access to preventive dental services for children increases use of preventive dental services and results in a decrease in the incidence of caries. In 1995, an increase in reimbursement rates for Medicaid dental services for children resulted in a 6% increase in use of services, although it has not yet been demonstrated that this further resulted in a corresponding decrease in caries or in the costs of restorative services provided to these children (Medical Assistance Administration, 1997).

Data Sources

Washington State Smile Survey - A Children's Oral Health Assessment Report, Washington State Department of Health.

Medicaid Data, Medical Assistance Administration, Department of Social and Health Services.

The National Survey of Dental Caries in US School Children, National Institutes of Health.

For More Information

Washington State Department of Health, Community and Family Health, Maternal and Child Health Oral Health Program (360)236-3523.

Technical Notes

The Washington State Smile Survey was conducted in 1994 and reported in 1996. The survey targeted those populations determined by secondary analysis to be at highest risk (based on low socioeconomic status, minority or immigrant status, and rural locations) but was also representative of geographic and rural/urban characteristics. Schools within selected counties were randomly selected.

The University of Washington third-grade study was undertaken in 1994. Small area analysis was conducted by adjusting for covariates measured at the school level, including ethnicity (per cent Hispanic) and the proportion of children on the federal free and reduced lunch program. Higher disease measures were associated with higher proportions of Hispanic students and greater levels of participation in the free and reduced lunch program.¹¹

Endnotes:

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Children with Special Health Care Needs

Summary

Approximately 18% of Washington's children who had a medical encounter in 1993 were identified as having a special health care need. Due to advances in medicine and technology, children with special health care needs are living longer with a larger proportion being cared for at home, in schools, and in community settings. As a result, care for these children will place greater demands on family and community resources.

Early diagnosis and access to a variety of medical, community, social, and school services can minimize the effects of many chronic and disabling conditions on the development of these children, regardless of diagnosis. Because of their extensive use of services, the population of children with special health care needs may serve as a sentinel group for ascertaining the impact of social and health system changes, such as welfare reform and managed care.

Who Are Children with Special Health Care Needs?

Children with special health care needs have ongoing health and developmental problems such as cancer, cerebral palsy, mental retardation, or attention deficit hyperactivity disorder (ADHD), that affect their physical, cognitive, or mental health. Despite the variation in their diagnoses, many of the consequences and experiences of these children are similar. As a result, it is useful to consider them as a group rather than by specific diagnostic categories.¹

Estimates of prevalence vary depending on how children with special health care needs are defined and the source of data. The Washington State Health Care Policy Board (HCPB) study of children enrolled in Medicaid and eleven private health plans (see Technical Notes) reported 18% of children under 19 years of age in Washington

Definition: Children with special health care needs have ongoing health or developmental problems with a biologic, psychologic, or cognitive basis lasting or expected to last at least one year, which produce one or more of the following: 1) limitation of function, activities or social role in comparison with healthy age peers; 2) dependency on intervention to compensate for or minimize limitations; or 3) need for services over and above the usual for the child's age, or special ongoing treatments, interventions or accommodations at home or in school.

who had a medical encounter in 1993, had some type of special health care need. By comparison, the disability supplement to the 1996 National Health Interview Survey (NHIS) reported a national prevalence rate for children with special health care needs as 25%.² The higher prevalence rate in the NHIS study is likely to result from the inclusion of conditions such as recurrent otitis media and chronic skin conditions which were not included in the HCPB Study.

Findings from the HCPB study indicate that approximately 11% of children have mild conditions, such as asthma or ADHD, requiring limited services. Approximately 6% have a moderate condition, such as cleft lip/palate or diabetes. Only 1% of children have conditions of high severity, such as leukemia or chronic ventilator dependency, requiring frequent and intensive services.

Time Trends

Data are not available to provide time trends for children with special health care needs. However, due to advances in medicine and technology, children with special health care needs are living longer with an improved quality of life.³ More children with complex care needs are being cared for at home, in schools and in community settings, thus placing greater demands on family and community resources.

Year 2000 Goal

Although there are no year 2000 Goals for children with special health care needs, there are year 2000 national objectives for Maternal Child Health which focus on the availability of and access to a wide range of diagnostic, curative, and preventive health care services for children. One such goal is to increase to 95% the proportion of children eligible for Medicaid who receive the full complement of Early Periodic Screening Diagnosis and Treatment (EPSDT) services (see Technical

Notes). In 1993, 62% of children 0-1 year of age enrolled in Medicaid in Washington State received EPSDT services; however, as the age of the child increased, they were less likely to receive appropriate EPSDT services.

Geographic Variation

Data are not available for Washington State regarding the geographic distribution of children with special health care needs.

Age and Gender

Data on the distribution of children with special health care needs by age and gender are not available for Washington State. However, data from the 1988 National Health Institute Survey Child Health Supplement indicate that, nationally, chronic conditions are slightly more prevalent for children ages 10-17 (315 per 1,000) than children under 10 (302 per 1,000). Chronic conditions were also found to be more prevalent among boys (326 per 1,000) than among girls (288 per 1,000).⁴

Income and Education

Data are not available for Washington State regarding the distribution of children with special health care needs by income or education.

Other Measures of Impact and Burden

Cost of Care. Although children with special health care needs comprise only 18% of the child population, they account for approximately 60% of the total medical costs for all children (Table 1). Children with chronic conditions have medical costs approximately six times that of children without a chronic condition. Costs also increase with the severity of conditions.

On average, families pay about 20% of their chronically ill children's medical expenses, equal to 12% of their income.⁴ Families experience additional costs due to time off work and productivity losses due to care related activities.

Impact on Families. Families provide the majority of care for their children with special health care needs. Family involvement in care may strengthen families and promote positive coping and interpersonal skills; however, there are negative impacts as well. Secondary health conditions, such as depression, psychological

distress, and declines in physical health are more common among parents and siblings of children with special health care needs than other children. These conditions result, in part, from the increased financial strain, , uncertainty about the future, social isolation, and fatigue often associated with meeting the child's care needs.⁵

Table 1: Distribution of Medical Costs for Children (0-18) by Severity of Condition, Washington State, 1996

Severity Level	Percentage of Allowed Claim Costs
Highest Severity <i>1% of children</i>	18%
Moderate Severity <i>6% of children</i>	19%
Mild Severity <i>11% of children</i>	18%
No Chronic Condition <i>82% of children</i>	46%

Source: Washington State Health Care Policy Board
Children with Special Health Care Needs Actuarial Cost
Analysis, 1996

Secondary health conditions and other outcomes. Children with special health care needs often experience secondary health conditions associated with their primary diagnosis, including decubitus ulcers, obesity, contractures, respiratory insufficiency, and depression.⁶ These children may also be at increased risk for child abuse and neglect due, in part, to the characteristics of their conditions, the psychological and social impacts on families, and their dependency for basic care needs as well as for social interaction.

As they transition into adulthood, children with special needs may have difficulty finding a practitioner who is able to provide services to them. While many are able to live and work independently as adults, others are at risk for unemployment, social isolation, and the inability to live independently.

School System Impacts. The majority of children with special health care needs are school-aged. Public schools are mandated to provide free, appropriate education for all children age 3 to 21. Children with special health care needs may receive a variety of services while in school, including nursing care, physical therapy, speech

therapy, occupational therapy, and special education. Data from a 1997 survey of school nurses in Washington found that all school districts serve at least one child with a chronic illness.⁸

Access Barriers

Of the 3,700 diagnoses included in the definition of children with special health care needs, each has a number of risk and protective factors particular to that diagnosis. However, risk factors for inadequate care and barriers to access are common among all children with special health care needs.

Early identification: Early identification is hampered because some conditions are rare and not easily identifiable (e.g., Rett Syndrome), and others do not become apparent until later in a child's development (e.g., ADHD). Additional risk factors for late diagnosis include lack of awareness among families and health care providers and lack of access to screening and diagnosis.

Complex systems of care: Care may be delayed or services denied due to overlapping or inconsistent eligibility criteria and policies regarding service provision among providers. The complexity of the care system creates gaps and duplications in services and confusion for families and providers who are trying to understand and work within the system.

Community and system capacity: Specialized health services are often centralized in large urban settings with tertiary level children's hospitals. A significant number of children live far from these settings, creating travel and time hardships on families and making coordination between community service providers and specialty care providers difficult. Increasing numbers of children with special health needs are entering managed care plans, many of which have limited experience managing care for this group of children.⁹

Low Income: For a multitude of reasons, accessing health care is more difficult for families with low incomes who face problems with transportation, difficulty maintaining continuity of providers, and unwillingness of providers to include uninsured and underinsured or Medicaid clients in their practice.¹⁰

Uninsured/underinsured: Nationally, 10% to 20% of children with disabilities or chronic conditions have no health insurance coverage.⁹

Even with insurance, many children are likely to lack coverage for some of the services needed to manage their condition. Lack of insurance or underinsurance result in increased financial burden to families, and postponement or omission of treatment.

Intervention Points, Strategies and Effectiveness

Public health interventions for children with special health care needs focus on assuring access to quality care for affected children and their families. Historically, this has been done by paying for or providing services directly. Now, a broader population-based approach is being used which assures services by building systems of care and promotes policy development based on assessment.

State and community-level assessment: Collection of population-based data relevant to children with special health care needs is still in the developmental stages. Because this population is diverse, the collection of representative data is particularly challenging. To assure the availability of appropriate services, however, data are needed on the number of children with special health care needs, types of diagnoses, health and functional status, where they live, service needs, and family impact. In addition, evaluation of services and interventions is needed and should include data on access to care, treatment and program effectiveness, satisfaction with care, quality of care, and gaps in services.

Assurance of services: Public health continues to be the payer and provider of last resort for services for children with special health care needs. Participation in the development of systems of care with other community partners, however, will result in services that are broader reaching and more sustainable. Approaches to system development include:

- training of health care providers,
- development of care guidelines,
- promoting and paying for parent consultation in program planning and health policy development,
- partnering with other state and community agencies to identify and address access barriers.

For example, through the Medical Home Training and Resource Project, over 700 primary

care providers have received information on community resources, health system changes, and efficient office practices. Similarly, over 500 public health nurses and school nurses received information and materials through the Children's Hospital and Regional Medical Center's Health Consultation Program in a two year period. Although the impact of these interventions has not been fully evaluated, providers who participated in these programs reported increased knowledge of community resources and improved skills to provide care to these children.

Responding to policy changes: Managed care has changed how health services are delivered, who provides the care, and which services are offered. The design of the State Children's Health Insurance Program will also impact service availability. These policy changes will impact all children, but will likely have a greater impact on those with special health care needs so that they may act as a bellwether for all children.

Collaboration among state and community agencies can result in policies that meet the needs of children with special health care needs. For example, in 1996, the Washington State Department of Health collaborated with the Department of Social and Health Services' Medical Assistance Administration to design components of their managed care program for individuals with disabilities. One activity included defining the responsibilities of and training for care-coordinators employed by the health plans. As a result of this collaboration, care-coordinators learned of the needs of children with chronic conditions and of existing community resources, which enhanced the appropriateness of referrals and continuity of care.

Data Sources

Washington State Health Care Policy Board, Children with Special Health Care Needs, 1997.

Washington State Health Care Policy Board Children with Special Health Care Needs Actuarial Cost Analysis, 1996.

State of Washington Medical Assistance Administration, Healthy Options Review, 1996-1997.

For More Information

Washington Department of Health, Division of Community-Family Health, Office of Children With Special Health Care Needs, (360) 236-3571.

Technical Notes

The prevalence estimates from the Health Care Policy Board (HCPB) study were based on 1993 medical encounter data for children enrolled in Medicaid and eleven private health plans. Children were excluded from the original Medicaid data set if they had not been enrolled in Medicaid for at least 6 months (infants) or 9 months (all other children). Application of these criteria resulted in a 46% (n=172,446) reduction of the original Medicaid data set. These criteria were not applied to children enrolled in private plans. The study included almost half of all children in Washington at the time (534,000).

The HCPB study used the National Association of Children's Hospitals and Related Institutions (NACHRI) classification system in conjunction with ICD-9-CM codes as a mechanism to distinguish severity level of conditions. Severity level is determined by the number, type, range and intensity of services required to manage the child's condition. Severity levels range from 1 (lowest severity) to 4 (highest severity).

This study was a collaborative effort between the HCPB, NACHRI, Children's Hospital and Regional Medical Center, and the Washington State Department of Health.

EPSDT services are well child visits at the appropriate intervals which include a history and physical exam; developmental or behavioral screen; mental health screen; and education or anticipatory guidance.

Endnotes:

¹ Jessop RK and Stein REK (1988) Essential concepts in the care of children with chronic illness. *Pediatrician*, 15:5-12.

² Hoffman C, Rice D, and Sung H (1996) Persons with chronic conditions. *J. Am. Med. Assoc.*, 276:1473-1479.

³ Newacheck, PW, Taylor, WR. Childhood Chronic Illness: Prevalence, Severity, and Impact. *American Journal of Public Health* 1992;82(3):364-370.

⁴ Newacheck P. (1990) Financing the health care of children with chronic illnesses. *Pediatric Annals*, 19:60-63.

⁵ Patterson JM, Leonard BJ, Titus JC, (1992). Home care for medically fragile children: impact on family health and well-being. *Developmental and Behavioral Pediatrics*, Vol. 13, No.

⁶ Crocker AC. (1997) The Impact of Disabling Conditions in Wallace RG, Biehl JC, MacQueen, and Blackman JA (Eds.), 1997 *Mosby's Resource Guide to Children with Disabilities and Chronic Illness*. St. Louis: Mosby-Year Book, Inc.

⁷ Reichert, S., Krugman, R.D., (1997). Child abuse, neglect, and disabled children. In H.L. Wallace, R.G. Biehl, J.C. MacQueen, and J.A., Blackman(Eds.), Mosby's Resource Guide to Children with Disabilities and Chronic Illness. St. Louis: Mosby-Year Book, Inc.

⁸ Joint Legislative Audit and Review Committee (1997) Survey of School Nurses Preliminary/Proposed Final Report. September 10.

⁹ Monahan C, Harders-Shanahan R, Maloney M, and Song J.(1996). Quality community managed care- A guide for quality assurance measures for children with special health care needs, includes pertinent measures from Medicaid HEDIS. Bureau of Maternal and Child Health.

¹⁰Ireys, HT, Katz, S. (1997) The Demography of disability and Chronic Illness Among Children in Wallace RG, Biehl JC, MacQueen, and Blackman JA (Eds.), 1997 Mosby's Resource Guide to Children with Disabilities and Chronic Illness. St. Louis: Mosby-Year Book, Inc.

Domestic Violence

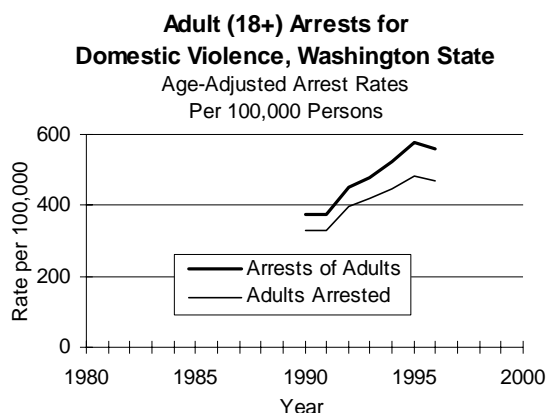
Definition: The definition of domestic violence used in this report was arrests for domestic violence-related felonies or gross misdemeanors. More broadly, domestic violence is a pattern of assaultive and coercive behaviors, including physical, sexual, and psychological attacks, as well as economic coercion, that adults or adolescents use against their intimate partners.¹

Summary

Domestic violence is a factor in injuries and deaths of women, and is involved in an estimated one-fifth of emergency room visits for trauma and one-fourth of homicides of women. Domestic violence also is associated with less optimal social, emotional, and cognitive development of children who are witnesses, and at least for boys, with a perpetuation of violence in the next generation. The development and evaluation of effective approaches to the recognition and prevention of domestic violence are needed.

Time Trends

National survey data from the yearly National Crime Victimization Surveys suggest that domestic violence toward women increased between 1992 and 1993 and then dropped during 1994–1996 (rates per 1,000 women were 8.8 in 1992, 9.8 in 1993, 9.1 in 1994, 8.6 in 1995, and 7.5 in 1996). Washington State Patrol data show an increasing trend for domestic violence-related arrests during 1991–1995 and then a slight decrease in 1996. However, these apparent trends may be due to changes in awareness and reporting or, for arrest data, changes in police response, rather than changes in domestic violence events.

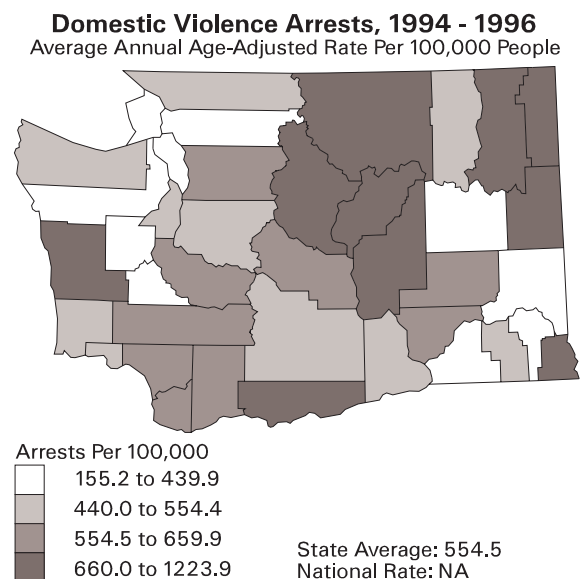


Year 2000 Goal

The year 2000 goal for the nation is to reduce physical abuse directed at women by male partners to no more than 27 per 1,000 couples; for comparison, the rate was 30 per 1,000 in 1985. Physical abuse was defined as being kicked/bit/hit with a fist, hit or attempted to be hit with something, beat up, threatened with gun or knife, or attacked with a gun or knife used.

Geographic Variation

The map below shows average rates of domestic-violence-related arrests and of persons arrested for domestic violence during 1994–1996 in Washington State. Apparent differences may be due to differences in reporting and to differences in rates of domestic violence.

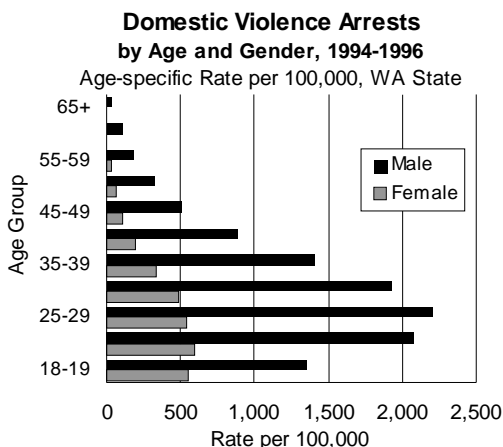


Age and Gender

According to the 1992–1996 National Crime Victimization Surveys, women, especially young women, are at the greatest risk of domestic

violence. These data suggest that women were about five to eight times more likely than men to experience domestic violence, and the rates of violence toward women ages 16–19 and 20–24 years old were highest (20 per 1,000), followed by those for women ages 25–34 (17 per 1,000) and women ages 35–49 (7 per 1,000). About 7 in 10 female victims of domestic violence reported that they were physically attacked. For the remainder, the attack was attempted or threatened, with nearly a third of these victims saying that the offender threatened to kill them. According to national 1996 Federal Bureau of Investigation homicide data, women were substantially more likely than men to be killed by spouses, ex-spouses, or other intimates. Of the homicides for which the relationships were known, domestic violence was a factor in 29 percent (n=1,326) of homicides in which women were the victims, and in 5% (n=516) of homicides in which men were victims.

Data from two National Family Violence Surveys suggested that among intact couples, the amount of violence between husbands and wives was similar. However, injuries were more numerous and more severe among women.

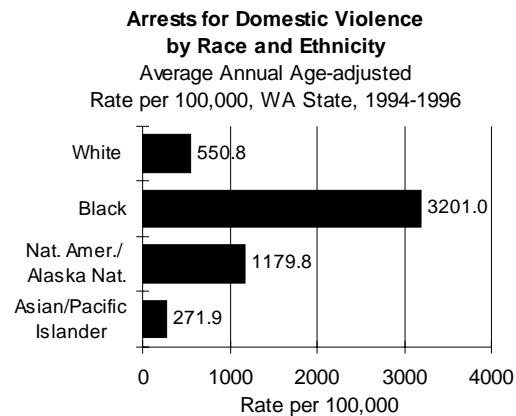


Race and Ethnicity

Research on the possible association between domestic violence and race/ethnicity has not yielded consistent findings. In Washington, and in some other areas, data show higher rates for blacks than whites. However, this association may be because blacks tend to be over represented in demographic categories that are at greater risk for partner violence (i.e., youthful, lower socioeconomic status, blue collar occupational

status) or because of differences in police responses.

Homicide by an intimate partner also appears to vary by race. In the United States in 1996, the rates of murder by an intimate partner were 1.3 for white women per 100,000 persons age 20–44, 0.5 per 100,000 for white men, 4.5 per 100,000 for black women, and 2.8 per 100,000 for black men.



Income and Education

Although domestic violence occurs at all economic levels, low income and low occupational status are consistent risk factors for domestic violence offenders. In the 1992–1996 National Crime Victimization Surveys, the reported rates of domestic violence decreased with each level of increasing family income. Women in families with incomes under \$7,500 were almost eight times more likely to report violence than were women in families with incomes over \$75,000.

Other Measures of Impact and Burden

Effects on Children Who Witness Domestic Violence. A recent review of the development of children who witnessed domestic violence suggested that these children were at increased risk for problems in their behavioral, emotional, social, and cognitive development.² Although many of these studies did not control for possible associations between witnessing domestic violence and demographic characteristics, child maltreatment, or residency in a shelter, similar results have been obtained in studies that did consider these factors.

Intergenerational Patterns of abuse. Among males, the association between witnessing domestic violence as a child and perpetration of

violence in adulthood is a consistent finding.³ Domestic violence can have long-lasting effects on future generations.

Health Impacts on the Victim. Recent studies in hospitals and emergency rooms have identified domestic violence as an often-unrecognized factor in female patient injuries. Although specific estimates vary, most studies suggest that at least one-fifth of injuries are due to domestic violence and that the number is higher for younger women, for whom as many as one-third of injuries may be due to domestic violence.⁴ Domestic violence during pregnancy can result in miscarriage, fetal injury, and low birth weight.

Victims of domestic violence experience high levels of depression, suicidal thoughts, and suicide attempts.⁵ More severe and chronic violence, sexual assault, and death threats are associated with higher levels of psychological distress.

Homicide. Although data are limited, several small studies suggest that victims of domestic violence have an increased risk of being homicide victims or perpetrators of domestic homicide. For example, in one small study, 80% of domestic homicides were preceded by at least one complaint of assault to the police and 50% by five or more calls.⁴ Another study, revealed that victims of domestic violence were 14 times more likely to be killed by a spouse, partner, or close relative compared to control subjects matched by neighborhood, sex, race, and age range. As noted earlier, the likelihood of being killed by a partner is greater for women than men, based on homicides for which the relationship is known.

Risk and Protective Factors

Experiencing Abuse as a Child. A history of being abused as a child was shown in 9 of 13 studies to be associated with domestic violence for both offenders and victims. In one study, almost four times as many male batterers reported having been physically abused as a child, compared to nonabusing men. These studies did not, however, examine this apparent association more closely by differentiating women who are victims of abuse from women who are in relationships that are not physically violent, but involve high levels of verbal conflict.

Witnessing Parental Violence as a Child. Men who witnessed parental domestic violence as children are more likely than other men to be

offenders. In one study, twice as many batterers reported witnessing abuse between parents, compared to nonabusing men. The association between women witnessing violence as children and being victims in adulthood is more equivocal, although some studies find an association. Not all children who experience abuse or witness domestic violence will experience violence in their adult lives.

Personality Factors. Two reviews^{3,6} suggest that several personality factors appear to differentiate offenders from nonabusive men. These factors are low levels of verbal assertiveness, low self-esteem, high anger/hostility, and depression, although high levels of depression may be a response to consequences of violence (such as separation from their partners) because undetected offenders in the community did not show increased depression. For victims, only low self-esteem has been a relatively consistent differentiating factor. It is possible that low self-esteem is a result rather than a precursor of violence, at least for victims.

Frequent Alcohol Use. Frequent alcohol use is a consistent factor associated with domestic violence offenders,³ and some evidence suggests that victims of abuse also are more likely than other women to drink frequently. In one study of over 15,000 white male military personnel, a problem with either alcohol or drugs each more than doubled the risk of relatively serious violence. The combination of heavy drinking, blue-collar status, and beliefs that violence against women is acceptable are particularly associated with male violence. It is not known whether changes in drinking levels would affect domestic violence because other factors (such as antisocial personality) associated with substance use may be responsible for this association.

Incompatibility and Conflict in the Couple's Relationship. Research on characteristics of relationships in which domestic violence occurs has found consistent associations between domestic violence and high levels of verbal aggression, religious and educational incompatibility, and nonmarried status.³

High-risk Groups

Young Women. As noted earlier, national crime victimization data suggest that women are at approximately five to eight times the risk of

experiencing domestic violence compared to men, and the risk is highest in younger age groups.

Separated and Divorced Women. Women in intact marriages appear to be at less risk for domestic violence compared to every other marital status except widowhood. In the 1992–1993 National Crime Victimization Survey, women separated from their husbands were 30 times more likely, divorced women nine times more likely, and never-married women four times more likely to report domestic violence in the past year compared to married women. The reasons for this association may include both heightened conflict during separation/divorce and a greater likelihood of divorce in couples in which there is domestic violence. Separation and divorce also appear to be associated with an increased risk of homicide of women by their former partners.

Men and Women Who Were Maltreated as Children. As discussed above, there is relatively consistent evidence that victims of child abuse are more likely to be involved in domestic violence, either as victims or perpetrators, than are non-maltreated individuals.³

Pregnant Women. Pregnant women and women who have recently given birth may be at increased risk of domestic violence. However, this association may be due to the generally younger age of pregnant women and, thus, higher risk rather than pregnancy itself. According to data from the Pregnancy Risk Assessment Monitoring System (PRAMS) in Washington State, 13% of women under 20 years old reported being hurt by a husband or partner during the year before the birth of a child, and this percentage decreased in each increasing age group, with the lowest rates (1%) among women over 35 years old. Women whose pregnancies were unintended have particularly high rates of domestic violence; however, the causal relationships are not well understood.

Intervention Points, Strategies, and Effectiveness

Intervention points for domestic violence include primary prevention programs for the general population; individual interventions for victims, offenders, and children; and justice system interventions. Although many of these community and clinical approaches have shown promise, their effectiveness has not been conclusively demonstrated.

Interventions for the General Population.

- **School-based programs.** Several primary prevention programs that teach alternative ways of dealing with potentially violent situations and aim at changing attitudes about intimate partner violence have demonstrated changes in current attitudes. However, their ability to affect future levels of violence is unknown.

- **Media roles.** Public education campaigns aim at changing attitudes about battering, willingness to intervene in battering, and knowledge of community resources. Information about effectiveness is not available, but public education campaigns have been part of other successful community prevention projects.

Interventions for Victims.

- ***Battered womens shelters.*** Shelters generally offer short-term residence (4–6 weeks) aimed at securing the victim's safety and providing her with information, advocacy, and options. Counselling services are often offered. Although evaluation research is limited, shelters appear to be successful in helping a substantial proportion (in the range of 45–80%) of clients to not return to the violent situation.

- ***Counseling/therapy.*** Therapeutic services include crisis intervention and individual and group therapy, and are generally aimed at improving psychological health (for example, increasing self-esteem, decreasing psychological dependence on the abuser, and decreasing beliefs that the victim is to blame for or can control the abuse). Research is needed on the effectiveness of the various approaches both in removing the victim from the violent situation and in improving the victim's psychological health.

- ***Health care responses.*** The health care community is an important potential source of identification and intervention for victims of domestic violence. However, this opportunity is often missed. In one study, 92% of domestic violence cases seeking care in an emergency room received no referral or follow-up information. Other roles for health care organizations, such as increased investment in crisis intervention, counseling, support groups, and advocacy, are also possible.

- ***Interventions for Offenders.*** Therapeutic services include individual and group therapy, and are generally aimed at stopping the violence and changing attitudes and behaviors. Although some

programs have reported positive effects on subsequent abuse, improvements compared to a control group are generally modest or nonsignificant. Attrition in programs for offenders is high, with an estimated one-third to one-half of offenders dropping out after the first session. Those who complete the treatment are more likely to be employed, and are older and better educated.⁶

Interventions for Children. Shelters for battered women and other agencies often offer crisis intervention and other services to children as well as their mothers. Although there has been little research on treatment strategies for children who witness domestic violence, research on psychotherapy for children generally suggests that therapy has positive effects on social and emotional development.

Justice System Interventions. Approximately one-sixth to one-half of victims of serious domestic violence are known to the police, so that law enforcement interventions comprise an important community contact. Although some studies have indicated that arresting the offender acts as a deterrent to future violence, not all studies have replicated this effect. Efforts to make the criminal justice system more responsive to victims' concerns include reforming laws; training police, prosecutorial, and court personnel; and providing victim advocates.

Data Sources

Washington State Patrol criminal history database.

For More Information

Washington State Department of Health, Noninfectious Conditions Epidemiology Section, (360-236-4248).

National Resource Center on Domestic Violence, 6400 Flank Drive, Suite 1300, Harrisburg, PA 17112-2778. Phone 1-800-537-2238; TTY 1-800-553-2508.

Washington State Coalition Against Domestic Violence, 8645 Martin Way NE, Suite 103, Lacey, WA 98516. Phone 360-407-0756; TTY 360-407-0760.

A statewide domestic violence hotline (1-800-562-6025 V/TTY) provides information about resources in Washington communities for women affected by domestic violence.

Technical Notes

The Washington State Patrol maintains a criminal history database on all arrestees in the state who are booked and/or fingerprinted for a felony or gross misdemeanor offense. The database also contains many misdemeanor offenses; however, only felony and gross misdemeanor offenses are required by

statute to be submitted by local law enforcement agencies to the state patrol and so only these are included in the present report. Each record includes an indicator for whether the crime was determined to be associated with domestic violence. Domestic violence crimes are those crimes that are committed by one family member against another, where family encompasses a broad array of relationships including spouses, former spouses, persons who have a child in common, persons related by blood or through marriage, and adults who reside together in the same household. The crimes include: assault, burglary, kidnapping, rape, malicious mischief, reckless endangerment, unlawful imprisonment, violations of no contact, restraining, and protection orders, and coercion by threat. In this report we report numbers of arrests and numbers of people arrested for domestic violence. We do not report the number of domestic violence "events," because failure to appear in court may lead to being arrested more than once for a single domestic violence event.

The statutory definition of domestic violence (RCW 26.50.010) states: "Domestic violence" means: (a) physical harm, bodily injury, assault, or the infliction of fear of imminent physical harm, bodily injury or assault, between family or household members; or (b) sexual assault of one family or household member by another."

Endnotes:

¹ Ganley A. Understanding domestic violence. In E Lee, N Durborow & PR Salber (Eds). *Improving the Health Care Response to Domestic Violence: A Resource Manual for Health Care Providers*. San Francisco: Family Violence Prevention Fund.1996.

² Kolbo, JR, Blakely, EH & Engleman, D. Children who witness domestic violence: A review of the empirical literature. *Journal of Interpersonal Violence*,1996;11:281-293.

³ Hotelling, GT & Sugarman, DB. An analysis of risk markers in husband to wife violence: The current state of knowledge. *Violence and Victims*,1986;1:101-124.

⁴ Stark, E & Flitcraft, A. Women at risk. Thousand Oaks, CA: Sage, 1996.

⁵ Browne, A. Violence against women by male partners: Prevalence, outcomes, and policy implications. *American Psychologist*, 1993;48:1077-1087.

⁶ Tolman, RM & Bennet, LW. A review of quantitative research on men who batter. *Journal of Interpersonal Violence*, 1990;5:87-118. Other references are available on request.

Drowning and Near-drowning Injuries

Definition: Drowning is death from a submersion event. Near-drowning is survival after a submersion event.
E-codes: 830, 832, 910

Summary

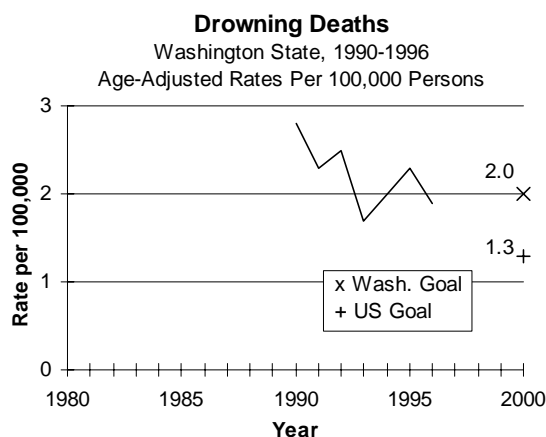
Swimming and other forms of water recreation are among the most popular pastimes of the American public. Every year an estimated 10 million persons use an outdoor pool or beach in Washington State. Washington has one of the highest drowning rates in the nation; from 1990–1996, Washington averaged 112 drownings per year (2.2 per 100,000 population), compared to the US rate of 1.7 per 100,000.

Drowning is a leading cause of injury death of young children (ages 1–4), and, for every child drowning, there are an estimated four near-drownings among children requiring emergency treatment and care. Of the near-drownings, approximately 20% suffer severe neurological impairments requiring long-term care. Annual estimated acute and long term care medical costs for drownings and near-drownings of children under age 15 are \$114 million in Washington State.

Drowning and near-drowning injuries are preventable through better child supervision, adequate barrier protection, and the wearing of personal flotation devices (life vests).

Time Trends

There has been a gradual downward trend in



the drowning rates over the past few years, from 2.8/100,000 in 1990 to 1.9/100,000 in 1996.

Year 2000 Goal

Washington's goal for the year 2000 is 2.0 drownings/100,000 population while the national goal is 1.3/100,000. Although data from the most recent year seem to indicate we have reached this goal, Washington's average annual rate in 1990–1996 of 2.2/100,000 is slightly higher than the national average (1.7/100,000) and exceeds the year 2000 goal. More specifically, Washington's year 2000 goal for children under 5 years of age is 1.8/100,000; 1990–1996 data indicated an average rate of 2.8 drownings per 100,000 children under 5 years old in Washington State.

Geographic Variation

Drowning data collected from 1980–1989 indicated a high incidence of drownings occurring among residents of densely populated counties. However, the occurrence by location was higher in the Olympic Peninsula, southwest Washington, and rural central Washington counties where large bodies of water are frequently used for recreation.

Age and Gender

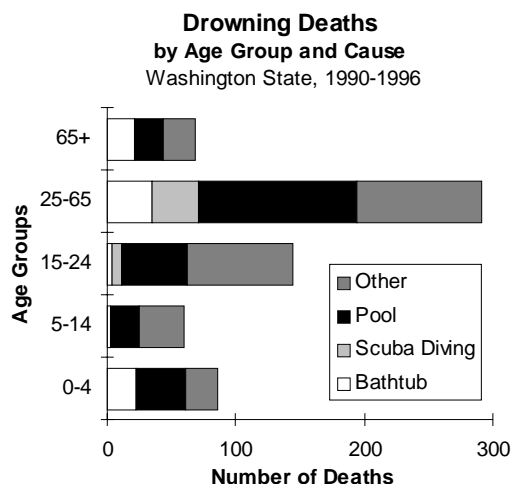
Age of the victims is a factor associated with drownings and near-drownings. For children under the age of 5 years, drownings are comparable with automobile crash-related injuries as the leading cause of total injury death. Most hospitalizations due to near-drownings occur among young children, and pools are the most frequent setting.

In the United States, drowning is the second leading cause of unintentional injury death for persons aged 5 through 44. Pools are the most common location for drowning in the youngest age group. Older children and adults are more likely to drown in open water. For adults over 25, the

highest proportion of drownings occur as a result of boating-related activities and water-skiing.

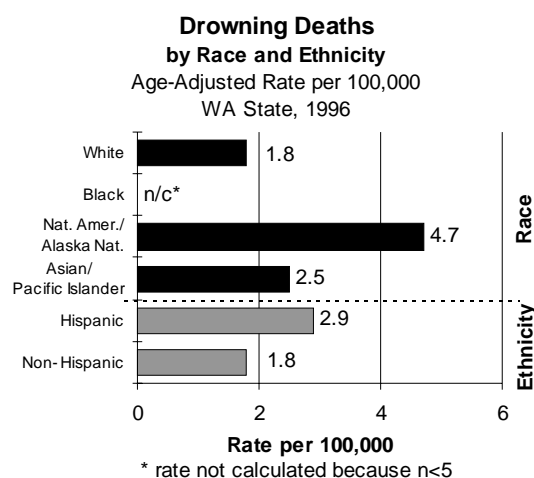
Males are much more likely to drown than females. During the period 1990 through 1996, 513 males (79% of total drownings) drowned compared to 137 females in Washington.

[The chart below can be misleading, as it shows numbers of deaths, rather than rates, for groups of the population whose numbers are not comparable. For example, it's not surprising that most drownings would be in a group (age 25-65) accounting for most of the population.]



Race and Ethnicity

Drowning rates vary by race. The highest rates are among Native Americans/Alaskan Natives.



Other Measures of Impact and Burden

Hospitalizations. From 1990–1996, there were 469 reported hospitalizations related to submersion incidents. The breakdown of the hospitalizations by age reveals this is a significant problem for young children. Children under age 5 represent the highest proportion (36%) of hospitalizations; ages 5–14 accounted for 18%, ages 15–24 accounted for 15%, ages 25–65 accounted for 25% and ages 65 and over accounted for 6%.

Quality of Life. For every child drowning, there are an estimated four near-drownings that require medical attention. Of the near-drownings, approximately one-third result in the patient dying following treatment in an intensive care unit. Tracking this problem is difficult because a cause of death other than drowning is often listed. The emotional impact on surviving family members following a drowning can be severe, as well.

Economic Impacts. Costs to families are high. Estimated costs of medical care for an initial stay in the hospital for a near-drowning victim range from \$2,000 to \$80,000. The lifetime costs of long-term care for a near-drowning that results in brain damage can be more than \$4.5 million.¹

Nationally, annual medical care costs are estimated at \$5.7 billion for water submersions of children under age 15; an estimated \$3.7 billion (65% of the total costs) is for children under age four. This would extrapolate to an annual total of approximately \$114 million for children under age 15 in Washington State. Of this, an estimated \$74 million in direct medical care costs would be for children under age four.

Risk and Protective Factors

Primary risk factors associated with drownings include:^{2,3}

Lack of Supervision. Lack of adequate supervision is probably the single most important factor related to drownings of young children, and a key factor for persons who have pre-existing medical conditions, such as seizure disorders.

Inadequate Barriers. Improperly designed and maintained pool barriers (for example, fences, pool covers, and self-closing, self-latching doors and gates), which allow small children access to pools or spas, increase risk of drownings.

Lack of Personal Flotation Device (PFD) Use. In 1995, 88% of boating-related fatalities in

the United States involved victims who were not wearing a lifejacket, up from 75% in 1994. The results of a 1995 survey in Washington State suggested that only 25% of all Washington residents in small boats wear PFDs. Of these, only 13% over 14 years of age wear PFDs.

Lack of Swimming Skills. People of all ages who lack swimming skills are at higher risk of submersion than are those with swimming skills.

Environmental Factors. Cold water, turbid water, riptides with ocean currents, and fast moving waters that appear quiescent are risk factors for drownings.

High-risk Groups

Young children under five years of age, males under 44, and people who spend time in small boats are at high risk for drowning and near-drownings. In particular, persons with seizure disorders have a greatly increased risk of drowning, especially in bathtubs.

Intervention Points, Strategies, and Effectiveness

Most drownings and near-drownings can be prevented. The following intervention and prevention strategies would help lower the rates of these incidents:

1. Promoting policies to ensure adequate supervision of young children, for example:
 - requiring lifeguards and appropriate signs at some facilities and safety reminders for adults;
 - ensuring that persons responsible for children at daycare facilities take children to recreational water facilities at which lifeguards are on duty;
 - working with the pool industry to provide responsible information on pool safety and supervision when selling and installing pools;
 - developing effective posted warnings at repeat drowning/near-drowning sites in natural waters, and prominently advertising the location and dangers of these areas;
 - developing safety programs for ensuring supervision and possible inclusion of PFD use for young children at public docks in

conjunction with port owners/managers; and

- developing a review board to assess all child drownings.
2. Requiring the placement of properly designed and maintained barriers to prevent unauthorized access to pools and docks.
 3. Promoting the use of PFDs for all ages in boats (especially boats less than 18 feet in length), providing PFDs at beaches for toddlers and non-swimmers, and ensuring that persons wear PFDs when in and around swift-moving water.
 4. Improving general education on water safety (including continuation and improvement of swimming lessons) and targeted education for certain risk groups and activities associated with drownings and near-drownings (for example, working with teenage males not to swim across a lake without floatation equipment or a buddy, or providing education to caregivers on the need for continuous supervision of people with seizure disorders while they are bathing.).
 5. Promoting partnerships with the insurance industry to develop incentives to ensure facilities are safely designed and operated.
 6. Improving our epidemiologic assessment activities of all drownings, near-drownings, and other submersion incidents; the evaluation of data and the factors related to drownings and near-drownings will allow us to continue the development of appropriate intervention strategies.

For More Information

Washington Department of Health, Office of Community Environmental Health Programs, (360)236-3036, and the Office of Emergency Medicine and Trauma Prevention, (360)705-6738.

Endnotes:

¹ US Consumer Product Safety Document #4359, U.S. Consumer Product Safety Commission, Bethesda, MD, 1985.

² Brill D, Micik S, Yuwiler J. *Childhood Drownings: Current Issues and Strategies for Prevention*, US Consumer Product Safety Commission, Summary Report, Orange County, California, 1987.

³ National Pool and Spa Safety Conference Proceedings, US Consumer Product Safety Commission (CPSC) & the National Spa and Pool Institute (NSPI), Arlington, Virginia, May 14, 1985.

Emerging Issues

Aging of the Population

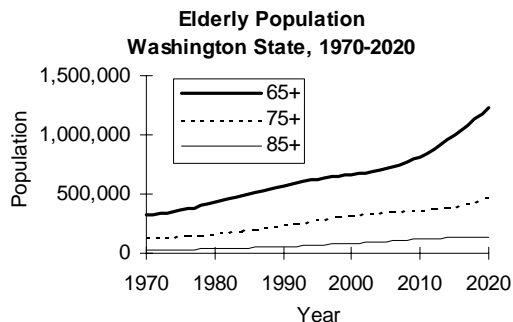
Summary

In the first two decades of the twenty-first century, Washington State's older population is expected to grow at an unprecedented rate as the baby boom generation reaches its retirement years. By 2020, roughly 1.23 million people in the state will be 65 years of age or older compared to 637,000 in 1996, an increase of 93%. Of these, more than 141,000 will be 85 or older compared to 72,000 in 1996. Demands for social and health services to meet the needs of the elderly will increase accordingly.

Time Trends

Washington's population has grown steadily since it became a state slightly more than one hundred years ago. By 1996, an estimated 5.5 million people lived in the state, and by 2020 this number is expected to reach 7.7 million. The population aged 65 and above grew gradually over the last 25 years, but is expected to increase more sharply after 2011, the year the post-World War II baby boom generation begins to turn 65. As a result, the proportion of the state's population aged 65 and over will increase dramatically from 11.5% in 1996 to 16.1% in 2020.¹

Age and Gender

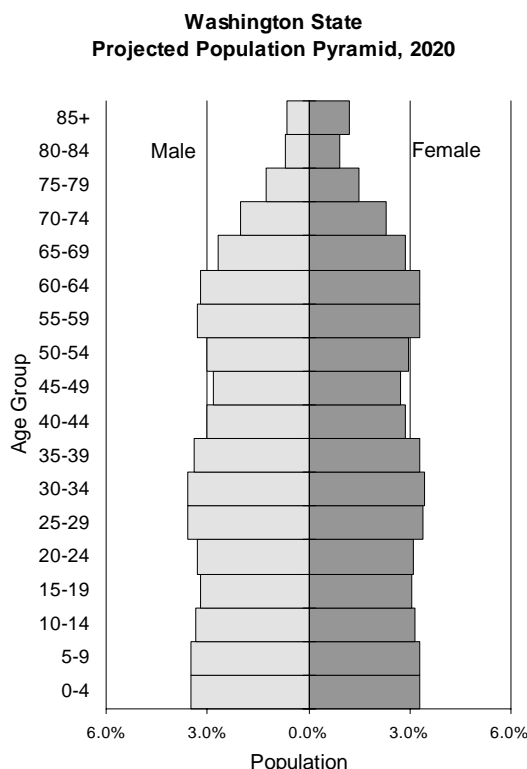
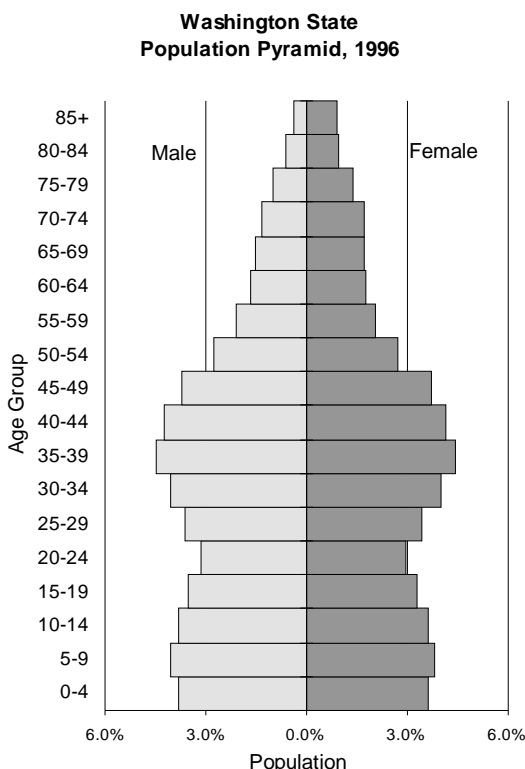


On average, women tend to live about six years longer than men. In 1996, the life expectancy of women was 80.2 years compared to 74.6 years for men.

The population pyramid, which is used to represent the proportional distribution of a population by age and gender, depicts the characteristics of an aging population. Differences between the pyramids for 1996 and 2020 shown at the top of the next page reflect the shift from a relatively young and midde-aged population to a more elderly one. The pronounced bulge in the middle of the pyramid for 1996 represents the baby boom generation as it reached ages between 35 and 50. The pyramid for 2020 is more rectangular, which is characteristic of a population with a greater proportion of older people.

Race and Ethnicity

Adequate projections of the age structure by race and ethnicity do not exist far into the next century. The Washington State Department of Social and Health Services recently completed a forecast of the state's population by race/ethnicity, age, and gender with projections to 2002.² Due to the nearness of this forecast, changes in the proportion of people in the major racial and ethnic categories relative to the 1990 census figures are relatively small. For the total population, the proportion of whites is expected to decline slightly from 88.5% to 88.1%, while increases are expected for blacks (3.1% to 3.6%), Asian/Pacific Islanders (4.3% to 6.3%), and persons of Hispanic origin (4.4% to 6.6%). Native American/Alaskan Natives comprised 1.7% of the total population in the state in 1990 and are expected to comprise 1.8% by 2002.



Among those aged 65 and older, the percentage of whites is expected to decline from 95.7% in 1990 to 94.4% in 2002 while the percentages are expected to increase for Asian/Pacific Islanders (2.2% to 3.5%) and persons of Hispanic origin (1.1% to 1.7%). No change is expected for the percentages of people aged 65 and over who are black (1.4% in 1990 and 2002) or Native American/Alaskan Native (0.7% in both years).

The projections for 2002 suggest that a slightly increasing proportion of the retirement-age population will be Asian or Pacific Islanders, a shift from 2.2% in 1990 to 3.6% in 2002. For each of the other racial or ethnic categories—African American, Native American/Alaskan Native, or Hispanic origin—no change is projected among the older population by 2002.³

Other Measures of Impact and Burden

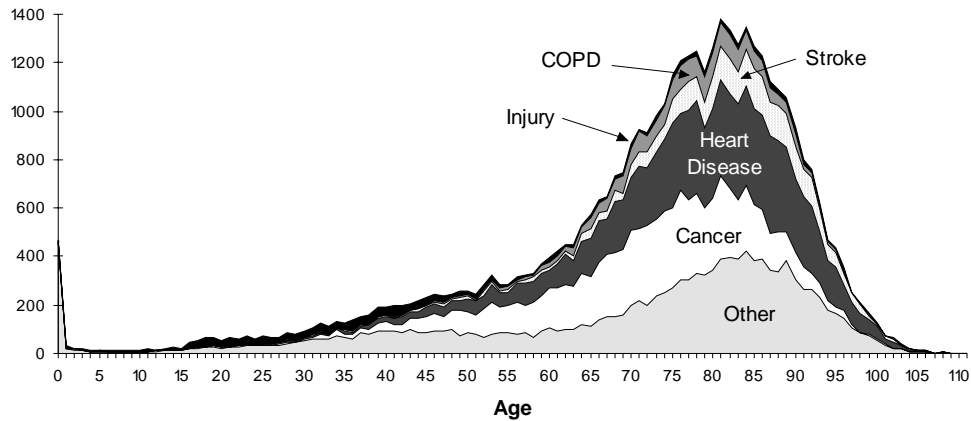
Mortality. The biological process of aging and the increasing susceptibility to disease and death associated with aging are commonly accepted as inevitable facts of life. Yet, improvements in nutrition, sanitation, medical science, and public health interventions have led to increased life expectancies that would have been

considered improbable a century ago. Since the early 1950s, the average remaining years of life for those who reached age 65 has increased between three and four years, depending on gender. At the middle of this century, men who reached age 65 could expect to live 12.9 more years, on average, compared to 15.5 more years for women.⁴ By 1996, the average remaining years of life for people at age 65 was 16.3 for men and 19.5 for women. How much life expectancy can be extended depends on advances in the treatment of chronic diseases such as heart disease, cancer, and cerebrovascular disease, and changes in life styles that contribute to the risk for such diseases.

Total deaths in 1996 from all causes by age and gender are shown on the next page.

Leading Causes of Death. In 1996, 42,248 residents of Washington died. Most of them—75.2 %—were 65 or older at the time of death. Heart disease and cancer, the two leading causes of death, accounted for 52% of all deaths and 67.9% of deaths to persons aged 65 or older. The average age at death for the four leading causes in 1996 was 77.4 for heart disease, 70.4 for cancer, 80.5 for stroke (cerebrovascular diseases), and 76.0 for chronic obstructive pulmonary disease (COPD). In contrast, the fifth leading cause of death was

Number of Deaths by Leading Causes by Age
Washington State Residents, 1996



unintentional injuries, which claimed the lives of 1,888 people in 1996 at an average age of 48.⁵

The age distribution of deaths due to the leading causes in 1996 is shown in the graph at the top of this page.

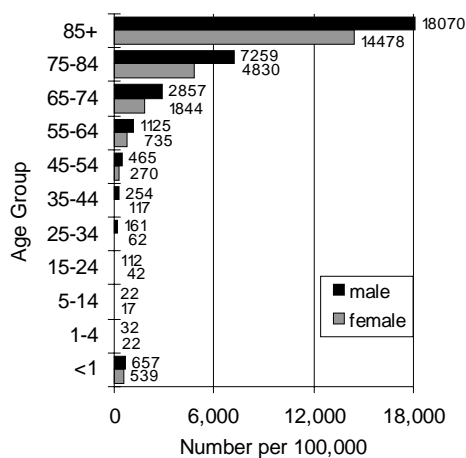
Hospitalizations. The likelihood of being

hospitalized also increases with advancing age. When hospitalizations associated with births and emergency room treatments are excluded, the age-specific hospitalization rates show a gradual increase in the chance of receiving in-patient hospital care from the late teens through the fifties. After age 50–59, the rates increase substantially.

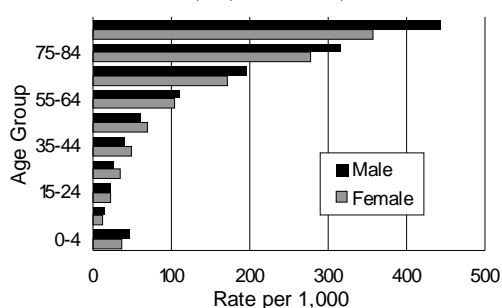
Long Term Care. By FY 1997, over 38,000 clients were receiving long-term care annually in Washington State, with 60% served through in-home and community services and the remainder in nursing facilities.⁶ Citing demographic projections of the population aged 65 and over in conjunction with national statistics on disabilities and persons needing personal assistance, the Department of Social and Health Services' Aging and Adult Services Administration predicts that demand for long-term care services will continue to grow.

To meet this growth in demand, plans are being developed for improved long-term care assessment and case management, expanded capacity for in-home and community services, and enhanced quality of care in all settings.

Deaths by Age and Gender
Number per 100,000 Population
Wash. State, 1996



Hospitalizations by Age and Gender
Rate/1,000, Wash. State, 1996



Data Sources

Population estimates and forecasts: Office of Financial Management, Forecast of the State Population, November 1997; Intercensal and Postcensal Population Estimates, December 1997

Population forecasts by race/ethnicity: Department of Social and Health Services, Adjusted Population Estimates by Race/Ethnicity, 1990-2002, June 1997

Death data: Department of Health, Washington State Vital Statistics, 1996

Hospitalization data: Department of Health, Comprehensive Hospital Abstract Reporting System (CHARS), 1987-1994

For More Information

Washington State Department of Health, Center for Health Statistics, (360) 586-8729.

Endnotes:

¹ Population estimates by the Office of Financial Management are based on trends in births, deaths, and migrations. In the future, mortality rates are expected to fall gradually based on assumptions derived from the U.S. Census Bureau.

² Department of Social and Health Services, *Washington State Adjusted Population Estimates*, based on estimates by Claritas, Inc. and Office of Financial Management, June 30, 1997.

³ Caution should be exercised in using these population forecasts due to the difficulty in obtaining information about migration patterns by race and ethnicity.

⁴ U.S. Department of Health, Education, and Welfare, *State Life Tables, 1949-51*. Washington, DC: U.S. Government Printing Office, 1956. Life expectancies in 1949-51 were calculated for whites only due to the small number of nonwhites in the state at that time.

⁵ The International Classification of Disease, Ninth Revision (ICD-9) codes for the five leading causes of death are: diseases of the heart (390-398, 402, 404-429), malignant neoplasms (140-208), cerebrovascular disease (430-438), chronic obstructive pulmonary disease (490-496), and accidents and adverse effects (also called unintentional injuries) (E800-E949).

⁶ The Department of Social and Health Services' Aging and Adult Services Administration's (AASA) recent report, "A Decade of Progress: Long-Term Care in Washington State, 1987-1997" describes improvements in the quality of long-term care and the expansion of in-home and community-residential care options.

Emerging Infectious Diseases

Definition: As defined in the 1992 Institute of Medicine report, emerging infectious diseases include those whose incidence in humans has increased within the past two decades or threatens to increase in the near future. Recognition of an emerging disease can occur because the disease is present in the population for the first time, because the disease has been detected for the first time, or because links between an infectious agent and a chronic disease or a syndrome have only recently been identified.

Summary

By the early 1990s, health experts no longer believed that the threat of infectious diseases was receding in the United States or elsewhere. Since then, recognition has grown that many modern demographic and environmental conditions, as well as the ability of microbes to evolve and adapt, favor the appearance and spread of new pathogens. In its 1992 report, the Institute of Medicine urged several federal agencies to work with state and local health departments to reestablish local surveillance of infectious diseases and to promote global efforts to detect and control emerging infectious diseases.

Time Trends

In the years following World War II, it was widely believed that humans were winning the centuries-long war against infectious microbes. Life-threatening bacterial diseases such as tuberculosis and typhoid fever could be treated by antibiotics, which became available in industrialized nations during the 1940s and 1950s. Diseases such as polio, whooping cough, and diphtheria, which had previously injured and killed millions of children worldwide, could be conquered through vaccination. Coupled with earlier improvements in urban sanitation and water quality, vaccines and antibiotics dramatically lowered the incidence of infectious diseases.

However, as early as the 1950s, penicillin began to lose its power to cure infections caused by *Staphylococcus aureus*, a common bacterium that can cause serious illness. In 1957 and 1968, new strains of influenza emerged in China and spread rapidly around the world, and in the 1970s there was a resurgence of sexually transmitted diseases. Also during the 1970s, several new diseases were identified in the United States and elsewhere, including Legionnaires' disease, Lyme

disease, toxic shock syndrome, and viral hemorrhagic fevers. During the 1980s, acquired immunodeficiency syndrome (AIDS) appeared and tuberculosis (including multidrug-resistant strains) reemerged, spreading quickly through U.S. cities.

Risk and Protective Factors

Many modern demographic and environmental conditions favor the appearance and spread of new pathogens. These include:

- human behaviors such as dietary habits and food preparation practices, poor personal hygiene, risky sexual behavior, and injecting drug use;
- global travel and movement of products (including food items);
- population growth leading to increased urbanization and crowding;
- changes in socioeconomic conditions;
- population movements due to immigration and migration;
- displacement of populations due to civil wars, famines, and other tragedies;
- ecologic changes due to irrigation, deforestation, and reforestation;
- periodic (for example, El Niño sea temperature changes), progressive for example, global warming), or anomalous (for example, unusually heavy seasonal flooding) changes in weather patterns; and
- increased human contact with tropical rain forests, which are reservoirs for insects and animals that harbor microbes that are dangerous for humans.

Another factor that contributes to disease emergence is the greatly increased use and intensity of health care services, including invasive medical procedures and immunosuppressive drug treatments, along with an increasing population of elderly and chronically ill patients.

In addition, some common microbes have developed resistance to antimicrobial agents (e.g., enterococci, malaria parasites, *S. aureus*, *Streptococcus pneumoniae*, and bacteria that cause gonorrhea, salmonellosis, and tuberculosis), while other diseases have reemerged because of breakdowns in the public health measures that had previously controlled them (e.g., cholera and tuberculosis).

Intervention Points, Strategies, and Effectiveness

The national Centers for Disease Control and Prevention (CDC), in close collaboration with public health experts and professional organizations, is developing a plan for dealing with the threat of emerging and reemerging infectious diseases. The plan's emphasis is on prevention activities built on the foundation of scientific knowledge gained through the implementation of surveillance and research efforts.

The plan identifies eight special focus areas:

- antimicrobial resistance;
- foodborne and waterborne diseases;
- diseases in persons with impaired host defenses;
- diseases of pregnant women and newborns;
- diseases transmitted through transfusion of blood or blood products;
- diseases of travelers, immigrants, and refugees;
- vector-borne and zoonotic diseases; and
- vaccine development and use.

For each of these areas, the plan calls for efforts to develop:

- enhanced capabilities at the federal, state, and local levels to conduct surveillance and response activities aimed at detecting, promptly investigating, and monitoring emerging pathogens, the diseases they cause, and the factors influencing their emergence;
- applied research programs to integrate laboratory science and epidemiology to optimize public health practice;
- adequate programs to strengthen local, state, and federal public health infrastructures to support surveillance and implement prevention and control programs;

- disease-specific prevention strategies; and
- materials and communication activities for dissemination to health professionals, health care providers, and the general public regarding public health information and emerging diseases.

For More Information

Institute of Medicine. *Emerging Infections: Microbial Threats to Health in the United States*. Washington, DC: National Academy Press, 1994.

CDC. *Addressing Infectious Disease Threats: A Prevention Strategy for the United States*. Atlanta: U.S. Department of Health and Human Services, Public Health Service, 1997.

CDC. Draft Report — *Addressing Emerging Infectious Disease Threats II: Entering the 21st Century*. Atlanta: U.S. Department of Health and Human Services, Public Health Service, 1998.

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Environmental Health Issues

Summary

Our environment contains many health risks—some naturally occurring, some produced by humans. The specific environmental health issues that are expected to demand attention in the coming years are being affected by three major forces:

- 1. Increasing population is causing increased pressures on the natural environment and its limited ability to remain clean and safe.**
- 2. Continued technological advances are producing more potential hazards that require monitoring and remediation.**
- 3. The advancing ability to rapidly move people and goods has created a world that is “functionally smaller.”**

These three forces often work together to influence environmental health issues.

Increasing Population Pressures

The population continues to grow, increasing demands on the environment to provide raw materials and to absorb the resulting waste products. The threats to adequate, clean drinking water is a prime example of the impact of this growth.

As the population continues to move into rural areas, it demands more water from more wells. As development continues, rural areas are converted to suburban or urban uses, and the quality and adequacy of surface water supplies can be adversely impacted. Other factors, such as the listing of salmon as an endangered species and potential regulations to protect stream waters, can create competing needs for limited water supplies.

One example of the hazards of potential contamination resulting from population pressures is nitrates. There is increasing evidence that nitrate contamination of drinking water supplies occurs in many areas of the state. Nitrate

concentrations exceed drinking water standards in some private and public wells in several Washington counties. Sources of nitrates include fertilizers, animal waste, and septic systems.¹ High levels of nitrates in drinking water can cause a rare but potentially fatal blood disorder in infants called methemoglobinemia, or “blue baby syndrome.”² This is only one example of the many potential contaminants affecting drinking water wells. The identification of contaminated wells and interventions to protect residents will require continuing diligence and substantial effort by environmental health professionals, developers, and the general public.

The increased population in urban centers can have a dramatic impact on air quality, as well. The environment’s ability to clean the air has been overwhelmed by the ability of society to produce air pollution. The most problematic pollutant sources are no longer large, single-source polluters, such as factories, but rather small, widely dispersed sources like the internal combustion engines in single-person commuter cars and wood-burning fireplaces. However, new control technologies and legislative actions have begun to address this issue, and the air quality in many areas—including Puget Sound—has started to improve in some pollutant categories.³

The move to recycle as much as possible and to minimize the population impact on the environment has led to the recycling of some industrial wastes into fertilizers. This practice can be a safe and economical way of getting necessary plant nutrients such as zinc into fertilizer products. Unfortunately, it can also result in fertilizers containing toxic substances such as non-nutritive heavy metals (for example, arsenic, lead, and cadmium) and dioxins.⁴ In 1998, Washington was the first state in the nation to regulate the non-nutritive content of fertilizers, mandate labeling specifications, and require further study of the health effects of such contaminants.⁵

In addition to increasing nitrates in drinking water, the trend toward more on-site septic systems (which occasionally fail) in rural settings has also had an impact on the water quality of Puget Sound. Bacterial contamination from failing septic systems and surface run-off due to agricultural practices in limited space has led to closures of many shellfish beds to commercial and recreational harvest in recent years. Programs at the state and local levels have led to cleanup of some bays and their reopening to harvest,⁶ but continuous monitoring is needed to ensure that any new problems are detected early and resolved quickly.

Technological Advances

The increased sophistication and availability of technological tools over the past few decades has enhanced efficiency in the workplace and, arguably, has enhanced the quality of life in the home, but the increased demand from an increased population for products of increased sophistication has also increased potential environmental hazards. Production of computer microchips, for example, requires the use of new and toxic chemicals. The rapid development of technology that relies more and more on toxic materials also increases the potential for spills that must be contained and cleaned up, and thus increases the amount of hazardous waste that must be properly disposed.

The ongoing discovery and cleanup of hazardous waste sites that resulted from previous disposal practices also requires substantial effort. The Hanford Nuclear Reservation in Eastern Washington was a production site for weapons-grade plutonium for many years. Several industrial plants at Hanford that were used to produce plutonium and other nuclear materials are now closed, but remain highly contaminated. The cleanup activities at the Hanford site will continue to require substantial efforts for years to come.

The increased ability to detect extremely small amounts of toxic chemicals is changing the practice of environmental health.

Laboratories now have the ability to detect many chemicals of concern in the “part per billion” range. As an example, laboratories can now detect dioxins at levels that were previously not measurable, which allows for more accurate exposure estimates that can result in improved public health protection. The continuing discovery of additional chemicals at very low levels,

improved exposure estimates, and the resultant evaluation of how these low levels might affect human health will require increased effort from environmental, public health, and regulatory agencies.

The Shrinking World

Events 12,000 miles away can now affect us in a matter of hours. The increased access to data and information, and communities’ expectations built from this acquired information also make the world seem smaller and creates an increased demand on environmental health programs.

The challenge of ensuring the safety of food is an ongoing concern central to environmental health. However, the effort to bring greater quantities and variety of foods to the table has complicated this challenge. To increase production efficiency and meet growing demand, increasing use of fertilizers has contributed to the increased nitrate contamination of drinking water wells. Additionally, rapid transportation and the global marketplace have now made it possible to bring in fresh food from around the world in 24 hours. But this importation of food sometimes involves the importation of disease threats. Hepatitis A contamination on strawberries from Mexico, *Cyclospora* contamination on raspberries from Guatemala, and *Salmonella* contamination on sprout seeds from Europe are recent examples of such problems.⁷

However, along with these increased threats, technology brings promise of new, effective tools to control these health threats. *E. coli* 0157:H7 contamination problems in ground beef and other food products might be controlled through the use of irradiation, which has been approved by the US Food and Drug Administration for use on ground beef. But even these technological solutions to old problems may engender new perceived or real threats; some consumer groups have expressed reservations about both the safety of irradiation and its possible effects on the nutritive value of food despite weak scientific evidence to support these concerns.

The rapid access to information is also changing the practice of environmental health. With current Internet search and distribution capabilities, individuals and the news media have access to a wide range of information. However, although increased dissemination of such

information can help to generate the development of innovative solutions, it can also generate significant community concern about problems that have very little real impact. Thus, to be responsive to communities' concerns, "risk communication" will grow in importance as a skill required for the practice of environmental health.

Intervention Points, Strategies, and Effectiveness

The policy framework for addressing the environmental health issues that will result from these three major forces are discussed below. Collectively, these elements will allow public health professionals, health care providers, elected officials, and members of the general public to successfully respond to the environmental health issues facing their communities.

Assessment of Environmental Problems that contribute to adverse health effects is critical to the practice of public health. The establishment of data systems and the conduct of research to identify linkages between health outcomes and environmental factors is a critical component of this assessment activity. Consideration of environmental health issues must be more prominent in the assessment of public health problems in our communities. The widespread application of a team approach, combining a focus on personal health issues and environmental health issues, is needed to best address communities' needs.

Regulatory Reform has presented an opportunity to streamline environmental health programs. Spending time and effort regulating marginal problems does little good for public health and causes unnecessary expense and frustration for those being regulated. The general public and their elected officials will support environmental health programs only if they make sense and are shown to be effective. Thus, environmental health programs must focus on real problems and provide reasonable solutions to address them.

A reasonable balance between regulation and education must be found by the joint efforts of environmental health, state and local agencies, industry, and the public. While regulating actions are needed in some cases, greater emphasis can be placed on education and consultation to jointly solve problems. The use of risk communication

and education about environmental health protection measures is important in this approach. Incentives must also be provided to facilitate the development of and encourage compliance with environmental health standards.

Awareness of environmental factors affecting health must be raised among health care providers, public health professionals, and the general public alike. Opportunities for enhancing this awareness must be pursued.

The public/private partnership approach to identifying and solving problems has proven very effective. It needs to continue and expand. Public and private interests working together have made a difference in a number of program areas, including food, drinking water, and shellfish protection.

For More Information

Washington State Department of Health, Environmental Health Programs, Frank Westrum, (360) 236-3180.

Endnotes:

¹ Nitrate In Drinking Water, Fact Sheet. Olympia: Washington State Department of Health. 1996.

² Virgil, J., Warbruton, B., Hayes, W.S., and Kaiser, W.R. Nitrates In Municipal Water Supply Cause Methemoglobinemia in Infants. *Public Health Reports*, 1965;80(12) 1119-1121.

³ 1997 Air Quality Report For Washington State. Olympia: Washington State Department of Ecology, Ecology Publication #97-208.

⁴ Screening Survey for Metals in Fertilizers and Industrial By-Product Fertilizers in Washington State. Olympia: Washington State Departments of Agriculture, Ecology and Health, and Washington State University. December 1997. Ecology Publication #97-341.

⁵ Substitute Senate Bill 6474, Passed Washington State Legislature, Olympia: 1998 Regular Session.

⁶ 1996 Annual Inventory of Commercial and Recreational Shellfish Areas in Puget Sound, WA. Olympia: Washington State Department of Health. 1996.

⁷ Final Report: Microbiological Safety Evaluations On Fresh Produce, For the National Advisory Committee On Microbiological Criteria For Foods. USDA and FDA, Washington DC, (in press, 1998).

Health Care System Changes

Summary

The structure of the health care system includes complex, interacting influences that can be considered as health risk and protective factors because they affect receipt of effective health care, including prevention services. Changes in health care market structure, health care financing, and technology are highlighted here as influences that need to be monitored and carefully interpreted to improve and protect the health of Washington residents by maintaining access to and the quality of needed personal health services.

Changes in the Health Care Market¹

Health care market variables include the organizational structure of health care providers; the degree of economic concentration (or common ownership and control) of providers, facilities, and insurers; and financing arrangements such as the types of health insurance and managed care contracts that connect payers with providers. It is impossible to single out one market variable as the root cause of the others. However, the single most prominent change under way is the shift toward integrated systems that combine insurance functions with direct influence over health care delivery.

Managed care takes many forms, but can be generally defined as approaches to health services delivery and benefit design of these variables that integrate management and coordination of services with financing to influence utilization, cost, quality, and outcomes. As noted in the 1996 *Health of Washington State*'s chapter on "Washington: The State and Its People", managed care at its best focuses on appropriate and cost-effective care, while at its worst, it can limit access to needed services.

Managed care is not new, especially in Washington; Group Health Cooperative of Puget

Sound was one of the nation's early models for health maintenance organizations (HMOs). Washington's 1993 health reform law incorporated managed care as a central element in a scheme for achieving universal access to cost-effective personal health services. However, the trend toward managed care continued through the force of private and public health care purchasing when the 1993 law was reused in 1995 and later legislative sessions, and moved Washington State health policy away from regulatory approaches.

Pressure from large health care purchasers to reduce cost escalation evolved slowly through the 1980s and early 1990s, and this further enhanced the growth of managed care. While Washington is home to many large corporate purchasers of health care, they have banded together less visibly and demanded less dramatic price cuts than in some parts of the country, such as in California. However, by 1997, the Boeing Corporation had greatly increased the proportion of its work force in managed care (by using cash incentives), and small and mid-sized employers had formed purchasing groups to increase their market power. A recent profile of the Seattle health care market concluded that private purchasers are satisfied with health care costs and quality, that public purchase strategies have a strong role, and that cost-cutting pressure in the near-term will remain moderate by national standards. In the longer term, how employer purchasing of health benefits will balance cost-containment, stable provider relationships, and desired attributes of quality and outcome remains to be seen.

The shift toward managed care inherently involves greater concentration of clinical influence than under fee-for-service arrangements. Market concentration is heightened by mergers and acquisitions among health plans, hospitals, clinical practices, clinical laboratories, pharmacies, and other health care institutions that seek economies of scale and market influence. Additional forms of

affiliation, especially among hospitals and physicians, focus on referral arrangements rather than ownership changes. The direct involvement of physicians in larger economic structures, such as multispecialty clinics that assume financial risk in service contracts and vertically integrated entities such as physician-hospital organizations, may be particularly significant as cost pressure from purchasers is passed down in contracts, creating incentives for efficiencies.

Time Trends²

The proportion of insured health care provided by the indemnity or disability insurance plans declined in Washington from 30% in 1992 to 15% in 1996.

Combining the Healthy Options program (Medicaid managed care, initiated October 1993) and subsidized enrollees in the Basic Health Plan, state-sponsored low-income enrollment in managed care increased from a very small percent in the early 1990s to about 63% in 1997. The proportion of state employees and retirees in contracted managed care has also increased to the point where it was one of the highest in the US in 1997.

In 1980, the three largest health insurance carriers (Group Health, Blue Cross of Washington, and King County Medical) shared 38% of the market, based on premium dollars. Counting these parent plans with affiliated plans (corporate mergers and alliances), their market share had grown to 62% in 1996.

Geographic Variation³

Changes in the organization and concentration of health plans and health care providers affect all parts of Washington, but their impact is most dramatic in rural areas. In many such areas, statewide expansion of the Basic Health Plan status in the early 1990s brought the first organization of managed care networks. Provider networks (that is, contractual relationships among physicians, hospitals, and other health care providers) have developed both as a result of participation in managed care, and as a response by rural providers intended to maintain local control and bargaining power.

Effects on Health Care

Impacts of Cost Containment and Cstructural Changes on Access to services and Quality of Care. There is a high level of consumer and provider concern about these health care changes. However, it is difficult to separate the facets of changes to identify discrete impacts on health. For example, overall health insurance coverage and access to essential health services have increased in Washington since the early 1990s, and changes in state and federal laws have restricted the ability of insurance carriers to reject applicants or exclude their pre-existing medical conditions. However, during the same period, consumer premiums and co-payments have increased, and utilization management within health plans has raised concerns about the adequacy of service access for persons who have insurance.

Impacts on Uncompensated Care.⁴ Increasing financial pressure on hospitals can reduce their willingness and ability to provide uncompensated care (which must be financed by shifting costs to other payers). While there have been slight declines in both charity care and uncompensated care (including bad debt) in Washington in the past few years, this may reflect increases in insured coverage (such as Medicaid expansions for children) rather than worsening access for those remaining uninsured.

Impacts on Access to Preventive Services. While cost-conscious health plans and providers might reduce preventive services, there also are counter-pressures. Many large purchasers, including Washington state agencies, require contracted health plans to report performance measures, many of them based on preventive services such as childhood immunizations and screening for breast and cervical cancer. More subtle indicators of preventive service, such as the quality of history-taking and counseling on healthy behavior, merit attention.

Impacts on the Management of Chronic Conditions. Chronic conditions may require frequent monitoring, consultation, specialist referrals, medication adjustments, and other aspects of clinical care that challenge continuity, coordination, and access. Continuity can be disrupted if changes in the plans contracted by employers and government programs require beneficiaries with such conditions to shift providers. However, poorly managed chronic

conditions can lead to avoidable hospitalizations and other adverse events, and can create economic incentives for the increasingly widespread use of focused disease management—typically involving clinical guidelines and more knowledgeable utilization review.

Impacts of Staffing Reductions on Care.⁵

In 1996, responding to legislative direction and public concerns related to downsizing, the state Department of Health (DOH) assessed the relationship between nursing staffing and quality/patient outcomes in hospitals and nursing homes. Based primarily on two recent national studies that included careful literature reviews, DOH concluded that, at current and recent staffing levels, there is such an association in nursing homes. In acute care hospitals, evidence is relatively strong for an association between staffing and a few specific outcomes, but is weak, conflicting, or lacking with respect to other outcomes that have been thought to be related to staffing. DOH's report also concluded that "...it is not certain whether these apparent impacts [in hospitals] are related to the staffing differences themselves or other more subtle issues such as differences in organizational arrangements and nursing autonomy." Current research on health care outcomes stresses the importance of understanding organizational contexts.

All these examples illustrate the need to monitor trends and to try to determine where significant impacts on health—both positive and negative—are resulting.

Groups of Particular Interest

Sentinel Groups for Determining the Impact of Changes in the Health Care System. Persons with chronic, complex, or costly health problems, and those with marginal access to health services, are particularly likely to be affected by changes that delay access to care or threaten its continuity. Important sentinel groups whose health outcomes may signal broader health care issues include children with special health care needs, persons with certain infectious diseases (such as HIV or tuberculosis), disabled adults of all ages, aging individuals whose health and functional range are deteriorating, rural residents in areas with limited health care providers, and low-income persons without health insurance.

Intervention Points, Strategies, and Effectiveness

Three forms of intervention in health care market trends are highlighted here: oversight by government and private accreditors, coordinated exercise of state market power as a purchaser, and the upsurge in consumerism.

Oversight. Washington's 1993 health reform law originally granted regulatory powers to a Health Services Commission, including definition of a minimum benefits package, limitations on the variation of premiums based on health needs, minimum standards for managed care plans, and provisions for approving consolidations or market conduct that might otherwise be challenged as antitrust violations. Subsequent legislation retracted most of these regulatory provisions. However, since 1995, several pieces of legislation have established new managed care disclosure requirements, prohibited clauses in health plans' contracts with providers that could stifle discussion of treatment options, and required access to women's health care providers. Also, as of February 1998, the Insurance Commissioner has adopted rules establishing or amending requirements for health care networks, provider and facility contracts, and issuance, renewal, and portability of policies. Nationally, Congress has begun moving into the traditionally state-regulated area of health insurance, including restrictions on the exclusion of pre-existing conditions contained in the Health Insurance Portability and Accountability Act of 1996.

An entirely separate area of health plan oversight is through national accreditation organizations, prominently including the National Committee for Quality Assurance (NCQA). As health care purchasers increasingly require or urge such accreditation, requirements in areas such as quality improvement, network adequacy, and grievance procedures are becoming market standards.

Long-standing and emerging regulatory programs also continue to shape the form and direction of the health care market. At one level, federal and state antitrust laws are intended to prevent market practices that restrain free competition. DOH is also responsible for several programs designed to regulate market entry and market structure:

- Certificate of Need approval of new health facilities or service agencies (such as home health), expansions in facilities' size (that is, number of beds), and initiation of certain tertiary hospital services;
- Review of the sale of nonprofit hospitals by DOH and the State Attorney General; and
- The 1993 health reform law's provisions for granting antitrust immunity.

State Purchasing Power.⁶ State agencies which purchase health care, notably the Health Care Authority (Basic Health Plan and state employees) and the Medical Assistance program of the Department of Social and Health Services, wield considerable market power in Washington. Their role as market leaders is further strengthened because they have coordinated their contracting, have set explicit performance expectations, and are operating in a market where the largest private purchasers tend to operate separately. The Interagency Quality Committee, created under 1995 legislation, has further broadened the coordination in state policy by involving other state agencies and private sector representatives to focus on quality and outcomes.

Consumerism. Consumers are beginning to react more strongly to the changes in health care delivery. The results can be seen in legislative discussion of consumer protection and disclosure bills, but also are visible in the importance that health plans, hospitals, and others assign to satisfaction as a factor in marketing and contract negotiation. State agencies have collaborated to make information available for consumer decision-making about options within state-purchased coverage. Examples include coordinated surveys of consumer satisfaction with plans and linked databases about what providers are affiliated with each plan option.

Implications for Public Health. Both state and local public health roles in relation to managed care and market changes are in transition. DOH has limited oversight of managed care, but has potential leverage through its relationships with state purchase agencies (including the Interagency Quality Committee and participation in on-site monitoring of state-contracted health plans). In addition to the previously noted DOH programs that regulate market entry and structure, other programs take a community development approach

to health care systems. These approaches are especially important in relation to rural areas, emergency and trauma services, and populations specially targeted in federal or state legislation.

Local health jurisdictions work with managed care plans in investigating and interrupting disease transmission, providing specific clinical services on a reimbursed basis, assessing community health needs and resources, and stimulating development of needed services and interventions. All these activities are affected by changes in the marketplace, such as increased cost-consciousness, consolidations that shift management control of health plans and service delivery to more distant locations, and potential new incentives to reduce costs through disease prevention and health promotion.

Finally, the upsurge in consumer activism related to health care may open new channels for communicating health promotion information.

Changes In Technology

Health care delivery in the United States is heavily influenced by the emergence of new technologies. Past breakthroughs in effective drug treatments and in complex, often expensive diagnostic devices (such as magnetic resonance imaging, or MRI) and invasive treatment procedures (such as open-heart surgery and organ transplants) have had significant impact on both outcomes and costs.

Telemedicine and Medical Informatics.⁷

A 1996 Institute of Medicine study defined telemedicine as "...the use of electronic information and communication technology to provide and support health care when distance separates the participants." Well-established clinical uses of telecommunication include phone consultation, "phoned in" prescriptions, and electronic transfer of radiological data. As of March 1997, 36% of Washington hospitals reported some type of telemedicine use that went beyond telephone voice conversation, and another 20% planned to use such technology.

Telemedicine holds promise to improve access to diagnostic services in isolated areas, allowing skilled specialists to serve patients at a distance, and supporting recruitment and retention of providers. However, there are few systematic evaluations of the impacts of telemedicine.

The automation and electronic transmission of other kinds of health data, often included under the broad term “health informatics,” is simultaneously increasing. Insurers, hospitals, and other large health organizations automate bill payment, scheduling, tracking of accountability measures, and other matters to reduce administrative costs. Automation creates new possibilities to track quality and health outcomes and improve the utility of medical records, but also heightens public concerns about the confidentiality of personal health information. Congress acknowledged the industry trend to automation, and a need to accelerate standardization, by requiring the US Department of Health and Human Services to develop uniform identifiers for providers, health plans, and enrollees, as well as other standard elements of health data transactions and ground rules for maintaining privacy.

Genetic testing⁸ is the analysis of human genes or gene products to detect disease mutations for clinical purposes. While genetic counseling based on patterns of inherited disease risk has been available for some time, and universal newborn testing is in place for certain genetically determined birth defects (such as phenylketonuria, or PKU), the number of conditions for which genetic tests are available is increasing. Almost six times as many genetic tests were performed in the United States in 1995 (94,705) as in 1993 (16,403). This trend will accelerate as the Human Genome Project completes its task of identifying and mapping human DNA, almost certainly by 2005.

Unfortunately, the health care system’s ability to ensure appropriate, high-quality, and cost-effective use of genetic services is not keeping pace with the growth of knowledge and technology. The contributions of genetic counseling and testing occur through targeted screening of groups at high genetic risk. Sometimes this leads to early detection and treatment of disorders. However, many conditions for which genetic markers exist cannot be “cured” yet, despite the long-term prospect that genetic research will stimulate new therapies. Therefore, many of the benefits of genetic information are related to greater certainty about the presence or absence of a specific condition, and through patients’ well-informed personal planning, including reproductive decisions.

These subtleties underline the importance of using genetic tests appropriately and following through with competent counseling. In general, health care providers need more information about genetic testing and its relation to their practice; genetic counselors and medical geneticists are often not available and, where they are available, they are often underused.

Intervention Points, Strategies, and Effectiveness

Telemedicine and Informatics. The State Board of Health has recommended actions to extend the availability of high-speed electronic transmission infrastructure and reduce line costs for small health-related entities. The national efforts to standardize automated health care transactions further reduce the reporting burden. Public concern about privacy also requires a high standard of security and confidentiality in public health informatics, and better communication about why public health access to personally identified data is important and legitimate. DOH is pursuing these objectives through national and state policy development processes, including public-private sector collaboration on how to implement the national data standards in Washington. New technologies for encryption and electronic pass keys are likely to be incorporated to provide increased protection of personal data.

Genetic Information. DOH has identified three priority areas for intervention to increase positive impacts of genetic testing, while reducing negative potentials:

- Education to inform physicians and consumers about genetics and the use of genetic information in health care;
- Quality assurance activities to increase the validity and quality of tests performed and the quality of genetic counseling; and
- Privacy/disclosure protections to prevent inappropriate disclosure of personal genetic information or discrimination based on such information.

For More Information

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